

THE IRON AGE

THURSDAY, SEPTEMBER 12, 1901.

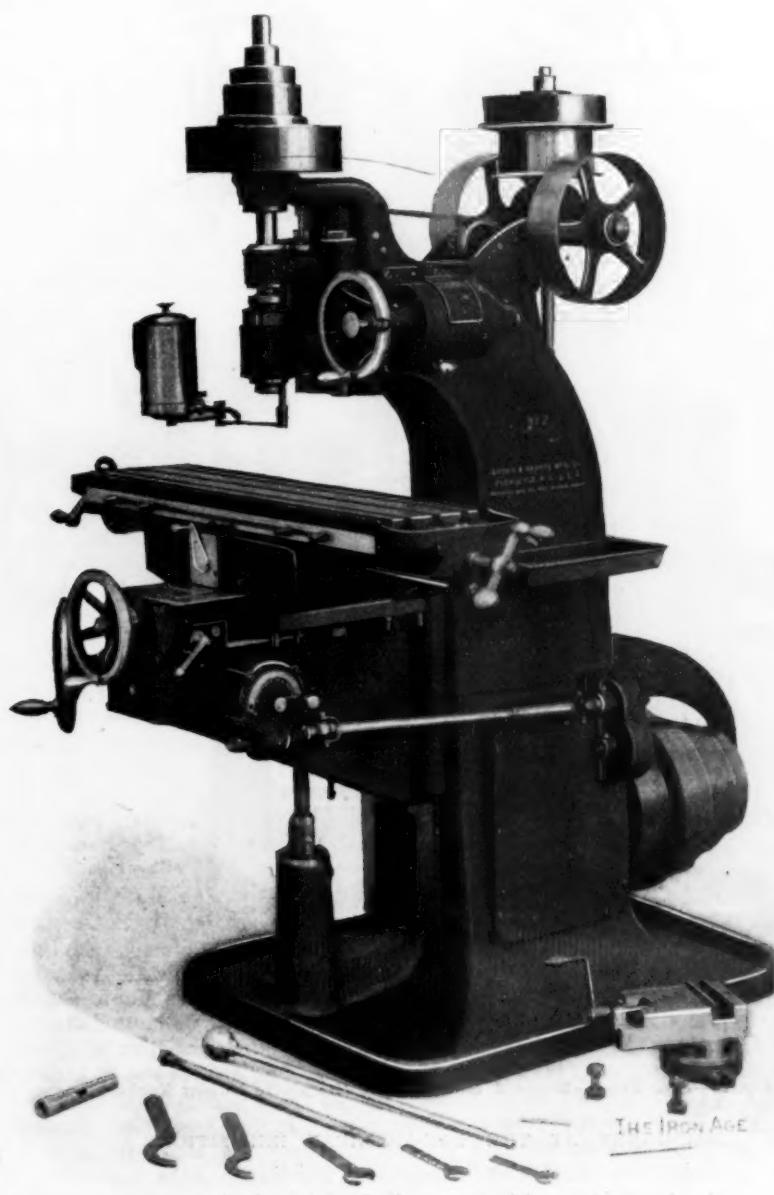
Machinery at the Pan-American Exposition.—VIII.

Brown & Sharpe Vertical Spindle Milling Machine.

The new vertical spindle milling machine designed by the Brown & Sharpe Mfg. Company of Providence,

cutting irregular slots in a surface and work of similar character. All levers, hand wheels, &c., for controlling the various movements of the machine are conveniently placed, thus enabling adjustments to be quickly made.

The spindle has a hole its entire length and runs in bronze boxes, the bearings being ground and lapped. The lower box is provided with means of compensation for wear. With two speeds of counter, 12 changes of speed are obtained, as follows: Using main cone, six



Brown & Sharpe Vertical Spindle Milling Machine.

MACHINERY AT THE PAN-AMERICAN EXPOSITION.

R. I., was first publicly shown at the Pan-American Exposition. This type of machine is being more appreciated as the peculiar advantages it offers are constantly being better understood, and for many kinds of work is preferable to a machine with a horizontal spindle. The use of a machine of this type permits the operator to more easily see the work, and more readily follow any irregularity in the outline of the work, as in profiling,

speeds, varying from 85 to 504, and using the high speed cone, six speeds, varying from 212 to 1260 revolutions per minute. The lower end of the spindle has a No. 10 taper hole. The arbors and cutters can be held by a bolt passing through the spindle. The distance from the center of the spindle to the column is 16 inches.

The spindle head has a vertical movement of 4 inches with fine hand feed, and quick return operated by the

same hand wheel, often serving the purpose of a drill press on work already in position for milling. The spindle pulleys are carried on a separate sleeve, thus obviating any strain on the spindle due to the pull of the belt. The fine hand feed and quick return for the spindle head are operated by one hand wheel. The fine feed of 0.052 inch per revolution of hand wheel is obtained by a system of differential gearing, and is engaged and disengaged by the simple movement of a knob on the front end of the shaft. This is a most simple and novel feature, and often enables the machine to be

in Fig. 2. The various changes are easily and quickly obtained by the simple movement of the hand lever B. The vertical shaft at the rear of the machine, which drives the mechanism, is operated by a belt running from the spindle pulley, the main spindle belt riding on the same. The lower cone of gears is driven from this shaft through bevel and spur gears. The upper cone of six gears behind the index plate is driven through an intermediate gear held by a yoke at the lower end of the controlling lever B. To change the feed it is only necessary to unlatch the lever and slide it along to the desired

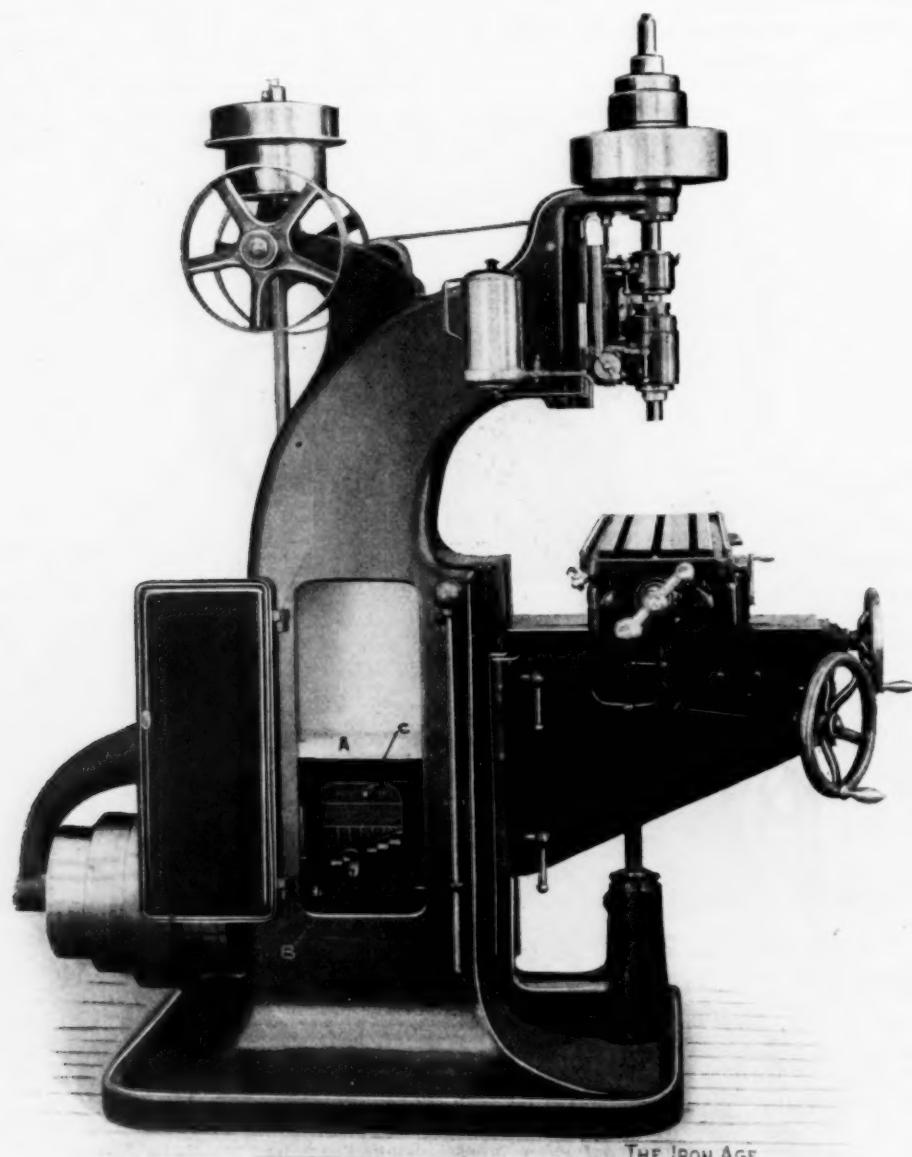


Fig. 2.—Side View.—Brown & Sharpe Vertical Spindle Milling Machine.

MACHINERY AT THE PAN-AMERICAN EXPOSITION.

used as a drill press for work already in position for milling.

A stop, with micrometer adjustment, is provided on the left side of the head for controlling the depth of cut. It is graduated to read to thousandths of an inch.

The table, including oil pans and channels, is 45 inches long, 10 $\frac{1}{4}$ inches wide, has a working surface 37 $\frac{1}{2}$ x 10 inches, three T slots $\frac{5}{8}$ inch wide, an automatic transverse feed of 12 inches, and can be lowered 16 inches from end of spindle. The elevating screw is of improved design and does not run below the base of the machine; the thrust is taken by ball bearings. The greatest distance from the end of the spindle to the top of the table is 20 inches.

The feeding mechanism for the table is shown at A

feed, plainly indicated on the index plate, and latch it into position under the feed indicated. The feed is carried from this mechanism through spur gears and a universal joint to the table. The table feed is driven by an auxiliary shaft, thus doing away with the necessity of a spline in the feed screw. The feeds of the table, longitudinal 26 inches, transverse 12 inches, are positive and automatic in either direction. The small lever C at the top of the index plate is for quickly changing the feed from fast to slow, or *vice versa*. This lever controls a clutch that engages gears on the shaft that drives the universal joint, thus making it possible to obtain 12 different changes of feed from 0.005 to 0.125 inch to one revolution of the spindle.

The knee screw is of improved design. It is of the

well-known telescopic form and does not pass below the base of the machine. The advantages are obvious.

The countershaft has two tight and loose pulleys, 10 inches in diameter for 3½-inch belt, and should run about 120 and 360 revolutions per minute.

The Youngstown Iron & Steel Roofing Company.

As noted in these columns last week, the new four-mill sheet plant of the Youngstown Iron & Steel Roofing Company at Youngstown, Ohio, was put in successful operation on Wednesday, September 4. The plant has been under erection since January of this year, at which time the Youngstown Iron & Steel Roofing Company decided to build a sheet mill, and for this purpose increased their capital stock to \$300,000. After the consolidation of the sheet mills had been made the concern found some trouble in getting prompt deliveries of sheets, and after a careful study of the situation decided that their interests would best be served by having a mill of their own, which would insure them a steady supply of sheets and of the kind particularly adapted to their purposes.

The history of the roofing business shows that steel sheets for roofing purposes do not last as long as iron, and for this reason the Youngstown Iron & Steel Roofing Company, when they determined to build a sheet mill, decided that they would make iron sheets, which are better adapted to their purposes and which they believe will last longer on the roof than steel. With this in view, the company placed contracts for two double puddling furnaces, a squeezer, bar mill and four sheet mills. The squeezer, bar mill and sheet mills were placed with the Braddock Machine & Mfg. Company, at Braddock, Pa., who made remarkably quick time in building and delivering the machinery. The main building is of steel construction, 300 feet long by 130 feet wide, and contains four hot mills, with accompanying roughing rolls, two cold mills, a sheet bar mill, two double puddling furnaces, squeezer, shears and other equipment. The building is commanded by a 40-ton electrical traveling crane, furnished by the Niles Tool Works Company of Hamilton, Ohio. The boiler plant contains two batteries of 600 horse-power each Sterling water tube boilers, also four Mehan waste heat boilers of 300 horse-power each. The machinery is electrically driven, power being furnished by a 150-kw. generator. The company have their own switch, giving them direct connection with the Erie, B. & O., Pennsylvania lines, Lake Shore and Pittsburgh & Lake Erie systems. It is the intention to also make a limited amount of steel sheets.

Sheet bars are received on their own tracks in 25 to 30 foot lengths and sheared, after which they are taken to the heating furnaces, reheated and rolled into sheets. The bar mill is not yet ready to start, but it is the intention of the company when it is running to break down their own billets into bars, believing by doing this they can get bars better adapted to their requirements. The company have also built a galvanizing plant and will furnish galvanized sheets of iron and steel, as well as black. It is contained in a building 150 x 60 feet and has modern equipment. The sheet mill is located on a site containing 7 acres of land, and foundations are already in for two more hot mills, which will be added in a short time. The concern have also about finished a new and very complete office building, which they expect to occupy in a short time. It is furnished with kitchen and dining room, the intention being to furnish meals to the employees. It has also toilet rooms and everything necessary for a first-class office building.

The business of the Youngstown Iron & Steel Roofing Company was established in Youngstown in 1894 in a small way, and has steadily grown since that time. About two years after the business was started the company took up the manufacture of metal lathing and bridge flooring, in which they have built up a very large trade. Two years ago the Youngstown Range & Stove Company were incorporated, the plant being located just beside that of the Roofing Company, the concern making a specialty of the manufacture of the Youngstown

steel range, a high class range, for which they have had a large demand. The new sheet mill will supply the entire requirements of both the Youngstown Iron & Steel Roofing Company and the Youngstown Range & Stove Company, and will also allow the concern to be sellers of sheets in the open market. They have already entered a large number of orders and their surplus product for the balance of this year is practically under contract. Much of the success of these two concerns is due to John O. Pew, who has been general manager of both since their inception. Mr. Pew is thoroughly versed in the requirements of the roofing trade, and believes that by having control of the sheet mill and knowing the stock that is going into the sheets it is possible to furnish better roofing to the trade than ever before. The two concerns have the same officials, these being L. E. Cochran, president; G. M. McKelvy, vice-president; Mason Evans, secretary and treasurer, and John O. Pew, general manager.

An International Aluminum Association.

It has been announced from Germany that negotiations are proceeding between the Neuhausen Aluminum Company, the big Swiss producer, and the Pittsburgh Aluminum Company, who are said to dominate the American market, with a view to the establishment of a convention "for the improvement of the industry," which is a euphemism for raising prices. According to *Engineering*, the negotiations promise to be successful, and if they should turn out so no secret is made of the intention to put up values immediately. Nothing is said about the inclusion of the English company, or about the French and the other Swiss producers, but no doubt one and all will give at least moral support to any efforts toward the end designed. The production of aluminum being limited, and in the hands of a very few individuals a scheme to regulate prices is easy, given active or passive sympathy on the part of the components, the more especially as the demand is about up to the output. Authoritative figures for last year are not yet available, but the compilations of the Metal Gesellschaft of Frankfurt show that for 1899 the aggregate was 5,748,380 kg., of which the United States furnished 2,948,380 kg., Switzerland 1,300,000 kg., France about 1,000,000 kg. and England about 500,000 kg. The Swiss figures include the production of the Rheinfelden Works, as well as of the Neuhausen, but not that of the Lead-Gestein, which had then been but a short time in operation. It would be interesting to know if anything has been done to secure the adhesion of the Rheinfelden and the Lead-Gestein as members of the convention. In that case and assuming that the Pittsburgh Company really do dominate the American market, control is assured, irrespective of the rest, who, as we have already said, will probably support the movement. If the rate of increase of previous years was maintained in 1900, the total production must have exceeded 7,000,000 kg. Certainly the producers have done their best hitherto to keep pace with the demand. In 1898, 4,033,704 kg. were reported; in 1897, 3,394,400 kg.; in 1896, 1,659,676 kg.; in 1895, 175,388 kg. and in 1895, 13,292 kg. Germany is the largest consumer, drawing most of its supplies from Switzerland and smaller measure from France. It imported 922,000 kg. in 1899. The American industry has made the most striking progress. In 1893 only 141,336 kg. were produced. By 1896 the quantity had increased to 589,676 kg.; by 1897 to 1,814,400 kg. and by 1899 to 2,948,380 kg. Switzerland has advanced with more deliberation from 650,000 kg. in 1895 to 800,000 kg. in 1898 and 1,300,000 kg. in 1899.

The New Castle Rolling Mill Company.—The New Castle Rolling Mill Company, organized recently at New Castle, Pa., are asking bids for the erection of a rolling mill to contain a 16 or 18 inch three-high mill. The equipment asked for is the rolling mill, one roll lathe, 30-foot band saw, two roll straightening machines, two drill presses, alligator shear, one 400 and 700 horse-power engine, 1000 horse-power boilers, &c. The company will manufacture light section rails, agricultural shapes and bars, &c.

Machine Cast Foundry Pig Iron *

BY ALBERT LADD COLBY, METALLURGICAL ENGINEER OF THE BETHLEHEM STEEL COMPANY.

As my invitation to address you this evening was received from your secretary only 10 or 12 days ago I have not had time to collect photographs or prepare lantern slides illustrating the various forms of ingenious machines for casting pig iron in iron molds now installed at many of our blast furnace plants. Nor have I had time to collect samples of machine cast iron other than from the Bethlehem Steel Company, with whom I am connected.

Pig iron cast in iron molds is known by various names in the trade, such as "chilled pig iron," "iron cast in chills," "machine cast pig iron," "machine made pig iron," "sandless pig iron," "sand free pig iron," &c.

You are all familiar with the older method of casting pig iron in sand. The stream of iron coming from the furnace and passing down the center of the casting house is turned to fill the first row of sand molds usually located at the far end of the casting house, although at some furnaces the bed nearest the furnace is filled first. When one row or bed of molds is nearly full a gate is opened and the iron passes from the central "runner" into the second row, &c., until the cast is completed. The main stream is called the "runner;" the feeder to each row or "bed" of molds is called the "sow," and the sand molds branching off from the "sow" are the "pigs."

No one can be about a blast furnace very long without having brought forcibly to his notice the difficulties attending the casting of pigs in sand. Furnaces sometimes smelt and reduce the ore irregularly, so that there are always times when the casting house is hardly cleared ready for another cast before the furnace should be again tapped. This is especially true if the skimmer has been washed away in the previous casting, and much of the iron covered over with a mass of cinder, so that the work of breaking up the hot iron and carrying it out of the casting house has been unusually hard. Work on the hot pig beds is severe at best, and there is always trouble getting laborers to stand this heavy work with its rapid changes of temperature, especially as it means work every day in the year, including Sundays and legal holidays.

With a small product of say 100 tons per day the casting of pigs in sand is not so serious a matter, but some better method of casting became absolutely necessary with the modern furnaces with a daily output of 300 to 500 tons, or even more. As Uehling says: "Necessity is the mother of invention, and the casting machine came into existence through sheer necessity, not to say desperation."

As far as I know seven different forms of pig iron casting machines have been built and operated. The Uehling machine, designed by E. A. Uehling, was first put into successful operation at the Lucy Furnace of the Carnegie Steel Company in September, 1896. Heyl & Patterson, Pittsburgh, designed and erected for the Cambria Steel Company another form of casting machine, which was put into successful operation in February, 1899. Mr. Davies designed and successfully operated a casting machine at a blast furnace plant in Canal Dover, Ohio. John M. Hartman, Philadelphia, erected a casting machine at the Hellertown furnaces of the Thomas Iron Company, which was first successfully operated on June 23, 1900. Erskine Ramsey of Birmingham, Ala., designed another form of casting machine for the Tennessee Coal, Iron & Railroad Company.

In England R. H. Wainford designed and erected at the Clarence Works of Bell Brothers, Middlesbrough, a casting machine which has since been referred to as "the Bell Clarence pig casting machine," and finally, Karl Orthof Donawitz, near Loeben in Styria, has designed still another form of casting machine.

At some blast furnaces, both at home and abroad, iron molds are used instead of molding the pigs in sand. This has been the practice for many years at the charcoal blast furnaces of Sweden.

Advantages of Machine Cast Pig Iron.

The advantages of machine cast pig iron to the makers of basic open hearth steel are now universally recognized. The number of basic open hearth furnaces receiving molten iron from a mixer, or direct from the blast furnace, or in some cases from a cupola, is on the increase. In cases where the iron is charged as pigs the machine cast iron is always called for, and sand cast basic iron accepted only at a reduced price. With a machine made iron there is no sand to attack the basic furnace lining. The higher proportion of combined carbon in the chilled iron makes the iron melt more rapidly, and as the combined carbon unites during melting more rapidly with oxygen than the graphite does the bath when melted is lower in carbon than when using sand cast iron, and hence more quickly converted into steel. These advantages in brief mean less fuel and increased output.

In puddling furnaces the machine cast iron is also more advantageous than the sand cast iron. The variable quantity of silica, with some little alumina added to the bath in the form of sand adhering to the sand cast pigs, causes irregularities in the basicity of the puddling cinder, and hence irregularities in the amount of phosphorus and sulphur removed. With machine cast iron the basicity of the puddle cinder is governed more closely by the silicon in the pig iron and the silica in the "fix," causing greater uniformity in the composition of the cinder, which in turn gives more uniform product, and tends to prevent sudden and irregular cutting of the furnace linings. The increased proportion of carbon in the combined state in the machine made iron is likewise an advantage, as the puddling operation is thereby shortened without detriment to the product.

In the use of Bessemer pig iron and of low phosphorus pig iron, whether melted in the cupola for the Bessemer converter or melted in an acid open hearth furnace, the same advantages result by the use of machine cast iron as have already been outlined above.

In the Foundry Trade.

It is, however, the application of machine casting to foundry pig iron with which this audience is most interested. Let me first call attention to the economic advantages resulting in the use of a machine made foundry pig iron, and then speak of the difficulties attending its introduction in the foundry trade.

In purchasing a machine made foundry pig iron the customer will receive 2240 pounds per ton of iron shipped; there can be no dispute about short weights, and that abomination, the "sand ton" of 2268 or 2256 pounds per ton is abolished. The amount of sand adhering to iron cast in sand varies greatly. When the iron is loaded directly from the casting bed and only has a short haul to the foundry the sand on the pigs is excessive. If loaded from stock and hauled a considerable distance more of the sand shakes off before the pigs reach the cupola platform, but at best that remaining is a detriment, and frequent cause for dispute in weights and an expense in melting.

In melting machine made iron the founder will find that he uses less limestone, and that therefore less slag is produced. This means less fuel to dissociate the carbonic acid gas in the flux and less fuel to melt the smaller amount of slag produced; also less loss of iron in the slag. The machine cast iron also melts easier, an item which gives a further saving in fuel. The melted iron is cleaner, contains no dross and that frequent cause for defective work, "dirty iron," is absent when using a machine cast pig iron. Another advantage of machine cast iron is that the pigs of the cast are more nearly alike in chemical composition than pigs of a cast of iron run from the furnace into sand; and furthermore, that there is a greater uniformity in the different parts of a machine cast pig than in sand cast pigs. This greater regularity of the different parts of a cast is due to the fact that the furnace is tapped into 20-ton ladles and the iron is thus mixed before casting the pigs. These are more uniform in composition, because they solidify more rapidly in the iron molds of the casting machine, and hence there is much less time for the im-

* Paper read before the Philadelphia Foundrymen's Association.

purities to segregate toward the top and center of each pig.

Those interested in knowing the actual difference in composition occurring in sand cast pig iron are referred to an article written by the speaker and published in *The Iron Age* of June 2, 1898.

Foundrymen's Objections to Sandless Pig Iron.

The speaker has met with four objections made by foundrymen to iron cast in chills, whether in the metal molds substituted for the beds of sand in the casting house or the molds of the casting machine.

1. The prejudice against all machine cast iron, due to the sale of some sandless misfit basic pig iron for foundry purposes.

2. The large size of the machine cast pigs.

3. The close grained fracture as compared with the fracture of sand cast iron.

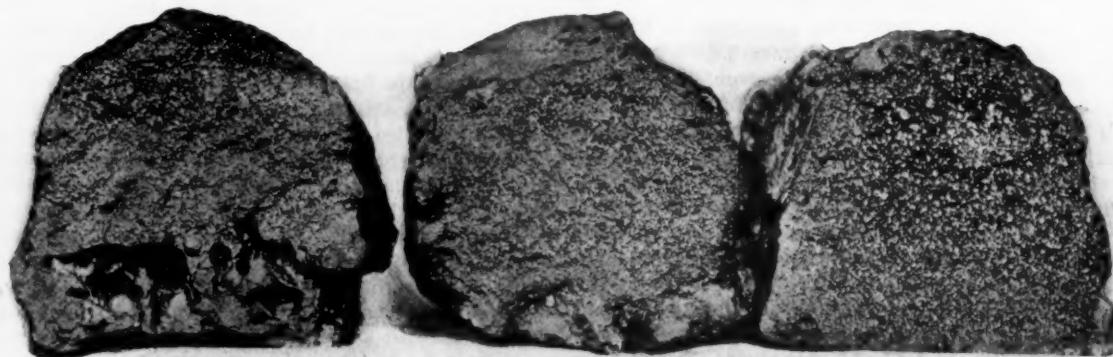
4. The difficulty in drilling the pigs for analysis.

1. There is a well grounded prejudice to machine cast pig iron, owing to the sale to foundrymen of misfit basic iron cast in chills, which, although perhaps high enough in silicon, is also often high in sulphur. Doubtless in many cases this iron had not the best analysis for the

graphite. The change of carbon is caused by the chilling action of the iron molds of the casting machine, and the further and deeper chill caused by the sudden cooling of the hot pig by immersion in a bath of water. This difference in the proportion of combined carbon is illustrated by the following analyses of a cast of Bethlehem iron, a portion of which was cast in sand and a portion in the casting machine:

	Sand cast.	Machine cast.
Cast No. 7602.	Per cent.	Per cent.
Combined carbon.....	0.250	0.920
Graphitic carbon.....	3.210	2.460
Total carbon.....	3.460	3.380
Silicon.....	3.00	2.99
Manganese.....	0.95	0.95
Phosphorus.....	0.770	0.773
Sulphur.....	0.041	0.041

The increased percentage of the combined carbon, the uniform close grain, and in some cases the increased density of the machine cast pig iron, gives higher tensile strength on specimens cut from the chilled pigs than on those cut from the sand cast pig. This increased tensile strength is misleading, for it only exists in the pig itself. When both the machine and sand cast pigs of the above cast, No. 7602, were remelted separately in



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No. 1.

No. 2.

No. 3.

	Combined carbon.	Graphitic carbon.	Silicon.	Sulphur.	Phosphorus.	Manganese.
No. 1. Beginning of cast.....	0.75	3.52	1.81	0.018	0.083	0.50
No. 2. Middle of cast.....	0.61	3.32	1.81	0.017	0.084	0.51
No. 3. End of cast.....	0.68	3.50	1.80	0.014	0.082	0.52

FRACTURES OF THREE PIGS OF SAME CAST OF IRON, SHOWING DISSIMILAR APPEARANCE OF SAND CAST IRON OF SAME COMPOSITION.

purpose for which it was sold to the foundryman. It was perhaps too high in sulphur, and very likely too low in total carbon for the kind of casting into which it was made. The unsatisfactory result attending its use has given a bad name to all machine cast iron in general, and has prejudiced the foundryman against its use. This is unjust to those furnaces making first-class machine cast foundry iron, but the prejudice is not to be wondered at; it can only be overcome by a straightforward explanation of the facts, and by giving a guaranteed analysis of the standard machine cast foundry pig iron offered.

2. The large size of the pigs of machine cast iron has been objected to. Some of the casting machines make a large pig, too heavy to conveniently handle on the cupola platform, and too large for economic melting in small cupolas. The Bethlehem machine cast pigs, however, weigh not over 90 pounds each, and are of such a shape as to be readily broken if destined to be melted in very small cupolas.

3. The main stumbling block to the introduction of machine cast pig iron in the foundry is the appearance of its fracture; its looks are against it. There are two ways of meeting this objection. First, by proving to the foundryman that the machine cast iron, although having a close grained fracture, will make, if it has the right chemistry, as soft and as easily machined a casting as an open grained sand cast pig iron of the same analysis.

The close grained fracture is due to the quick cooling and to the temporary conversion of considerable of the total carbon into the combined form, with a correspondingly temporary reduction of the percentage of

a cupola and cast into similar sized test ingots, standard test specimens threaded on each end and of an area at point of fracture of 1 square inch, gave the following results:

	Tensile strength. Pounds per square inch.
Standard U. S. Army.	
Test specimen cut from—	
Machine cast pig.....	41,000
Sand cast pig.....	15,000
Cast vertically.	Cast horizontally.
Test ingot cast from machine cast pig.....	17,000
Test ingot cast from sand cast pig.....	16,300

Castings made at the same time as the above test ingots from remelted sand and remelted machine cast iron were machined with equal ease, and showed similar fractures. The following analyses show that the excess of combined carbon in the machine cast pig disappeared after remelting: *

	Combined.	Graphitic.	Total.
Sand cast pig.....	0.250	3.210	3.460
Machine cast pig.....	0.920	2.460	3.380
* Test ingot cast by remelting sand cast pig—			
Cast vertically.....	0.368	3.022	3.390
Cast horizontally.....	0.470	2.930	3.400
Test ingot cast by remelting ma- chine cast pig—			
Cast vertically.....	0.257	3.100	3.357
Cast horizontally.....	0.336	3.028	3.364

*For a more detailed account of this experiment see *The Iron Age* of June 20, 1901, pp. 22-23, and "Journal of American Foundrymen's Association," Vol. X, June, 1901.

Another practical illustration of the fact that the chill in the pig iron does not reappear in the casting made therefrom, if the chemistry is right, is the use of old chilled iron car wheels by foundrymen. At one time when old car wheels were cheap the speaker knows of an instance where 5000 tons were purchased by a maker of cast iron pipe. The wheels showed a deep chill, but the chill did not show in the pipe. The wheel made strong pipe, but it was uniformly gray in fracture, and contained no hard or chilled spots.

The second method of meeting the objections of the appearance of the fracture of machine cast iron is to submit to the foundryman facts showing how often the appearance of the fracture of sand cast iron is misleading, and prove to him that chemistry is the only safe guide to uniform success in the foundry. How can regular results be expected in the foundry when buying pig iron by grade when the published analyses of nine different brands of say, No. 1 Northern coke foundry iron vary as follows in silicon: 1.75, 2.00, 2.40, 2.53, 2.70, 3.00, 3.08, 3.25 and 3.44 per cent. These analyses, as well as the following, were selected from S. R. Church's book, entitled "Analyses of Pig Iron," published in May, 1900. Notice the wide variation in silicon in 19 different brands of No. 2 Southern coke pig iron: 1.73, 1.92, 2.01, 2.14, 2.16, 2.25, 2.32, 2.40, 2.42, 2.45, 2.47, 2.50, 2.88, 2.90, 2.92, 3.05, 3.12, 3.30 and 3.79 per cent. These variations could be proved by further quotations to exist in all the different grades of both Northern and Southern coke foundry pig irons.

In fact, the argument can be narrowed down to the different shipments of No. 1 iron of the same brand and from the same furnace. Let the foundryman have each car of his No. 1 iron, purchased only on grade, analyzed for silicon and sulphur for, say two months, and the wide variations in the figures will surprise him. The converse of the above statement also holds good, for often iron of the same brand and of widely different grade, as shown by the fracture of the sand cast pigs, is exactly alike in chemical analysis. Why should a foundryman continue to purchase iron by the appearance of its fracture when every conscientious furnace man will admit to him that wide variations exist in the composition of the same grade of iron, and that often the foundryman pays a higher price for a No. 1 X iron than there is any necessity for?

The speaker does not mean that the foundryman can safely ignore the fracture of sand cast pig iron if he does not include the total carbon in his chemical specification, especially if he must make very soft castings, but he does mean to have it understood that if the foundryman specifies the correct silicon, sulphur and total carbon, with possibly manganese desired, that he can safely ignore the appearance of the fracture and stoutly refuse to pay a higher price for an iron of the composition he desires, because it happens to have a No. 1 X fracture.

Among the advantages claimed for machine cast iron some have made the statement that the appearance of the fracture of machine cast iron is a safer indication of its quality than with sand cast iron. The value to the furnace man of the chill cup test, used at some furnaces as an indication of the sulphur and silicon contents of the pig, is cited in illustration of the above statement. The speaker thinks, however, that it will be

found in actual practice that the fracture of machine cast pig iron, especially from different furnaces, is an unsafe guide, and should not be depended upon by the foundryman as a substitute for the chemical analysis. To prove this opinion the speaker has taken the trouble to bring samples here to-night of the different kinds of machine cast pig iron made at Bethlehem, and desires to call particular attention to the marked influence of the presence of manganese on the appearance of the fracture of both low phosphorus, Bessemer and high phosphorus pig irons.* The size and shape of the molds used in different makes of casting machines and the different methods used for cooling the hot iron by water will probably make it impossible to compare the fractures of machine cast iron from different furnaces.

4. The fourth objection which the speaker has heard made about machine cast iron is the difficulty in drilling the pigs for analysis. This brings up the general question of how to sample pig iron, to which important matter I will ask your attention in concluding my remarks.

Sampling Pig Iron for Analysis.

With the more general incorporation of chemical specifications in contracts governing the sale of pig iron for all purposes the question of how to determine whether the shipper has lived up to his contract becomes more important. If seller's and buyer's chemists do not agree the first step should be an exchange of samples to check accuracy of analytical methods; in some cases the service of a reference chemist will be required. Such a test is only just when the sample drillings are ground and thoroughly mixed, and when a sufficient quantity for duplicate analysis is distributed to each chemist. Marked differences between the furnace analysis on which the casts of pig iron are selected for shipment on a certain contract and the report of the buyer's chemist on the cars of iron received will more often be due to improper sampling of the iron than to inaccurate analytical work. Every one knows of the unavoidable variations in the chemical composition of different parts of a cast of sand cast pig iron, or for that matter in different parts of a single sand cast pig. (See *The Iron Age*, June 2, 1898, pages 13-16).

The furnace man must consider each cast of iron as a unit, and should spare no pains or expense to obtain a sample representing the true average of the cast. He cannot honestly claim to have done this unless he has taken four or preferably six samples of the molten metal during casting; when the casting machine is used the sampling can best be done as the large ladles of iron are being emptied into the molds by filling a small test ladle at stated intervals. If these test ladlefuls are cast into small ingots the sample analyzed should consist of an equal quantity of drillings from each of the four or six ingots; if each small ladleful is poured into water the same number of shot from each sample should be pounded together to make the average sample of the cast. In filling an order the furnace man must consider each cast as a unit, and select those casts for shipment the furnace analyses of which fall within the customer's specification. As cars vary in size, and as the railroads always insist on having them loaded to nearly their full capacity, it is impossible to ship each cast of pig iron separately, for it may weigh less, but more often considerably over the capacity of the car; the best the fur-

*The exhibit created considerable interest and discussion on account of the fact that it included five kinds of pig iron, low phosphorus, Bessemer, basic, mill and foundry, and in each case when possible, as shown by the following analyses, a low and a high silicon iron had been selected. The samples were arranged in pairs, one sample showing the fracture of a low manganese iron, and the other of a high manganese iron.

Low Phosphorus.

	Per cent.	Per cent.	Per cent.	Per cent.
	No. 1.	No. 2.	No. 3.	No. 4.
Silicon	0.74	0.77	2.02	2.07
Manganese	0.35	1.73	0.32	2.00
Sulphur	0.018	0.025	0.017	0.017
Phosphorus	0.030	0.025	0.028	0.027

Bessemer.

	Per cent.	Per cent.	Per cent.	Per cent.
	No. 5.	No. 6.	No. 7.	No. 8.
Silicon	1.04	1.03	2.54	2.49
Manganese	1.12	2.55	1.30	2.20
Sulphur	0.056	0.049	0.023	0.027
Phosphorus	0.061	0.065	0.060	0.068

Basic.

	Per cent.	Per cent.
No. 9.	No. 10.	
Silicon	0.36	0.35
Manganese	0.94	1.86
Sulphur	0.060	0.053
Phosphorus	0.827	0.801

Mill.

	Per cent.	Per cent.
No. 11.	No. 12.	
Silicon	1.20	1.20
Manganese	1.20	1.80
Sulphur	0.035	0.025
Phosphorus	0.823	0.770

Foundry.

	Per cent.	Per cent.
No. 13.	No. 14.	
Silicon	2.54	2.49
Manganese	0.88	1.78
Sulphur	0.033	0.037
Phosphorus	0.749	0.847

furnaceman can do, therefore, is to load casts of similar silicon and sulphur contents on the same car.

It is obvious that the customer's chemist when sampling the iron must consider each carload as a unit, and from what has been said it would be manifestly unfair for him to condemn a car of iron on the analysis of drillings from only two or three pigs. A good routine method of sampling consists in selecting two pigs from the surface of the carload of iron at points equally distant from each end of the car and two more pigs from the bottom of the car, preferably at different distances from the end of the car. These pigs should be broken and drilled in the fracture preferably by the use of a wide angle blunt pointed drill, 2 or 3 inches in diameter, using rather a slow feed, so as to obtain uniformly fine drillings. If this requires a larger drilling machine or more power than can be assigned to the task a number of holes may be drilled in the face of each pig, using a smaller drill.

If the analysis of an equal portion of carefully mixed drillings from each of these four pigs shows a wide variation from the chemical specification under which the iron is purchased the car of iron should not be condemned by the customer without taking a more thorough sample, consisting of a dozen, or better 20, pigs selected from different parts of the car. The pigs should be selected arbitrarily and no attention paid to the fracture. With sand cast iron sold on a guarantee of 0.050 per cent. a customer could unfairly condemn many cars shipped by selecting only the pigs showing the closest grained fracture, and by taking drillings for analysis with a small drill in the top part of each pig.

Sampling Machine Cast Pig Iron.

When the iron is machine cast the proper sampling of each car is a laborious undertaking. If low in silicon the iron is so deeply chilled that the pigs can only be drilled in the center, if at all; the presence of 1.00 to 2.00 per cent. of manganese also renders machine cast iron very hard to drill. When impossible to drill the reduction of chips of the chilled iron to a powder in a steel mortar is a slow operation, unless the laboratory is unusually well equipped for such work. The speaker has described in *The Iron Age* of June 2, 1898, a very convenient form of steel mortar and pestle with which samples of chilled iron can be quickly pulverized.

Without for a moment denying the right of the buyer to check the furnaceman's analysis the speaker believes that the furnaceman has a much better opportunity of determining, by conscientious sampling, the true average composition of each cast of iron, and he ventures to predict that with the more general introduction of machine cast iron the customer will purchase iron from furnaces where proper care is used in sampling, and then rely, with only an occasional check, on the furnace analysis of the casts loaded on each car, which information should be given on cards tacked on the inside of each car, and also by postal card advices of each day's shipment from the furnace.

This suggestion does not apply to the closer inspection necessary in some cases if the customer suspects that the furnaceman is shipping a little of his "misfit" iron on the bottom of each car of pig iron guaranteed as "standard." This dishonest practice, unfortunately carried on to some extent, is sure of detection sooner or later, and is sure to react seriously on the reputation of this furnaceman's iron in the trade.

If several cars of the same iron are to be placed in one pile, in order to equalize the difference in the chemical composition of the carloads, the first car unloaded should be distributed horizontally and evenly throughout the length of the proposed pile, the second carload similarly on top of this, and so on. Then by using vertically downward from one end of the pile, iron will be obtained which will conform very closely to the average analysis of the drillings from each car.

The greatest advantage which will result by the general introduction on the market of machine cast foundry pig iron, in the speaker's opinion, is that it will tend to hasten the day when foundry pig iron will no longer be sold by grade, based on the appearance of the fracture, but will vary in price according to its chemical analysis, which is fair alike to producer and consumer.

Carbo-Mangan.

The Carbo-Mangan Company of Nyack, N. Y., are now manufacturing and selling a steel refining compound called "carbo-mangan." This is the first that the compound has been placed on the general market, but under the name of the Excelsior compound its inventor, John H. Smith, placed it with many large firms, such as the Cramp Shipbuilding Company, John S. Naylor's People's Works, Neafie's Ship Yards, the Portsmouth Navy Yard, &c., where it has been successfully used for several years. It has been recently adopted by contractors on the New York subway, where its use on the automatic drills is giving highly satisfactory results. Carbo-mangan acts on the metal from surface to center. Its use results in a gain in tensile strength and toughens the metal without hardening or rendering it brittle. Two pieces of steel cut from the same rod were tested by Riehle. One piece was untreated and broke at an ultimate strain of 36,000 pounds per square inch. The other, treated with carbo-mangan, required an ultimate strain of 42,000 pounds to break it. Many of the tests made by Riehle showed a gain in tensile strength of over 33 per cent. The cost of using the compound averages about $\frac{1}{2}$ mill per pound of metal treated.

A cast iron bath is furnished at cost by the company and which they recommend to all users of the compound. It keeps the compound covered when not in use and prevents the accumulation of a scum of dirt or dust so detrimental to any successful work with steel. Since the entire cover is removable at will, the bath admits of the treatment of a large tool or blade. When it is employed the compound uses up more slowly. The bath holds 30 pounds of carbo-mangan and leaves ample working room, this amount of compound lasting a large shop several months.

The Red River Furnace Company.—The Red River Furnace Company will, on October 1, acquire the property of the Red River Iron Company and Clarksville Furnace Company, including the Helen Furnace and limestone properties and the ore lands in Montgomery County, Tenn. In addition this company have prospected and bought 1500 acres of low phosphorus ore lands in Hickman County, Tenn., on which ore washers and mining plant are being built. This recently acquired ore property, together with the company's splendid limestone quarries, puts the Red River Furnace Company in a strong position as to raw material, and will enable them to continue to manufacture the Red River iron, which has attained a high position in the Western market as a strong foundry iron. The capital stock of \$200,000 has all been subscribed. Graham Macfarlane holding 999 shares; M. Savage, 1 share; R. B. Hickman, 499 shares; H. L. Williams, 500 shares, and H. N. Leech, 1 share. The company are expending \$50,000 on new plants and improvements at the furnace. The officers are Graham Macfarlane, president; H. R. Williams, vice-president; R. B. Hickman, secretary; Mary A. Senter, treasurer. Under this same management the Red River Iron Company have been very successful. With increased resources they should do better in the future. There is a noticeable absence of water in the capital stock.

An erroneous report has been going the rounds of Western newspapers relative to the intention of the English Supply & Engine Company of Kansas City, Mo., to start a rolling mill. It is not their purpose by any means to engage in this branch of business. They are operating a foundry and machine shop devoted to the manufacture of steam engines and boilers, and will probably operate that branch of their business under the name of the English Iron Works Company.

The Cleveland Pneumatic Tool Company have opened a Chicago office at 335 Wabash avenue, in charge of H. S. Covey, where samples of their complete line of chipping, beading and calking hammers, the Cleveland long stroke riveting hammers, piston, rotary and breast drills may be seen.

Efficiency Test of a Continuous Rod Mill.

An interesting test was conducted by Robert W. Hunt & Co., Chicago, Ill., July 15 to 27, 1901, to determine the efficiency of a Morgan continuous rod mill—viz.: The amount of fuel used in gas producers and boilers; the amount of billets heated and weight of rods rolled, together with all data relating to the operation of the plant. The following is condensed from the report in question:

Description of Plant.

The plant consists of a Morgan continuous rod mill having 14 passes, six sets of rolls for roughing and eight sets for finishing. A general view of the mill is shown in the accompanying engraving, Fig. 1. The mill is operated by a single cylinder, non-condensing Cooper Corliss engine. The cylinder is 34 inches in diameter and 48-inch stroke. The roughing rolls are driven by gearing

There are two Morgan gas producers, each fitted with the Bildt feeding device. The producers are 8 feet inside diameter and 12 feet high. They are blown by means of a steam jet of special form, which siphons into the producer heated air from under the furnace. This blast enters the producer at the center under a hood, and is regulated by a valve at the front of the furnace.

There are six horizontal tubular boilers, 70 inches by 22 feet, fitted with George grates, but during this test only five were used, as the other was cut off to supply steam for driving artesian wells.

Method of Testing.

The following observations were taken:

1. Weight and number of billets.
2. Number of billets not rolled into rods.
3. Weight, number and size of rods rolled.
4. Weight of mill scrap and finned ends.
5. Weight of coal used on producers.
6. Weight of coal used under boilers.
7. Indicated horse-power of both engines.

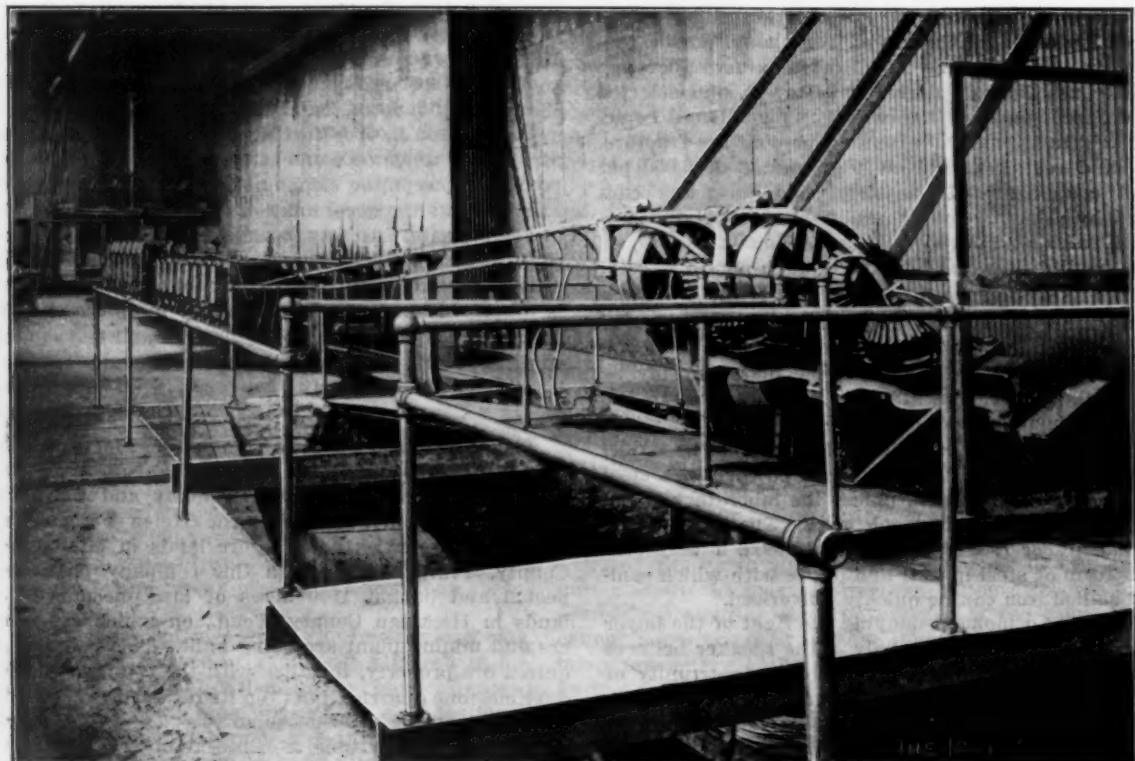


Fig. 1.

THE MORGAN CONTINUOUS ROD MILL.

and the finishing rolls by belting. The reels are also run from this engine.

A Buckeye engine, 10 x 18 inches, supplies power to the air fan, dynamo, air compressor and the pumps for supplying water to the rolls and the rod conveyor. The rolls for charging billets into the heating furnace and to the mill, the feeding device on the producers, the turning lathe and drill press and the scrap shears are also operated from this engine.

The furnace, which is directly behind the continuous mill, has a bed about 15 x 32 feet, set on a slope of one in six, as shown in Fig. 2; the billets are charged at the upper side and pushed down by means of a ram operated by a steam cylinder. The air enters a space in the wall on the lower side of the furnace through ports left for that purpose. It is then drawn over the top of the furnace and enters the fan, which forces it into and through a heater surrounding the stack and down through conduits (under the floor) into checker work and under the furnace floor. The heated air enters the furnace through cast iron boxes set in the wall at the lower side of the furnace. The gas from the producers enters the furnace through a flue under the floor and mixes with the air—the proper proportion being obtained by means of water cooled flat valves.

8. Pressure of steam in boilers, gas in chamber and draft in stack.
9. Temperature of gas in chamber of heated air, and of flue gases.
10. Running time of mill, and accidents and cause.

1. The billets used were uniform in size, 1 1/4 x 1 1/4, and approximately 30 feet long. The billets were weighed in carload lots. Each car was carefully weighed, loaded and emptied, on accurate track scales, and a careful count of billets in each car was kept. During the two weeks' run four different lots of steel were used—viz.: Bessemer and open hearth steel from the Illinois Steel Company and National Steel Company, the carbon ranging from 0.12 to 0.13.

2. A careful account was taken of all billets weighed and not rolled into rods.

3. The rods were weighed in trucks on a double beam platform scale. The number of bundles and the time of weighing was recorded. No. 5 rod was rolled throughout the entire run, with the exception of four hours on Friday and Saturday mornings, July 26 and 27, when No. 4 rod was rolled.

4. The mill scrap and finned ends were weighed separately, and after each turn were cut up and disposed of. The finned ends were all cut off on the hot

conveyor before the bundles were weighed. This work was carefully watched. The long pieces cut off by the knife at the end of the roughing mill were saved and used as test pieces for the finishing mill, but the rod made was not long enough to save, and was counted as mill scrap.

5. The coal used in the gas producers was weighed in wheelbarrows before it was wheeled up to the producer house, and was kept separate for each producer. Samples were taken continually for chemical analysis.

6. The coal for the boilers was weighed in carload lots, and that which remained at the end of the week was weighed back. During the first week only the coal necessary for running the mill was weighed—i. e., from 6 a. m. July 15 to 12 noon July 20; but for the second week the entire amount was recorded—i. e., the extra coal for banking fires, getting up steam, &c., or all the fuel used between noon July 20 to noon July 27. The coal used in the boiler house was Black Hill coal from the Pawnee Mines, Illinois.

7. Both engines were indicated at frequent intervals during the entire test.

Quality of Rods.

The rod rolled was slightly oblong in section, there being about one-half a gauge difference between maximum and minimum diameters; but this section was uniform throughout the length of the bundle. The maximum variation was less than a gauge, and more often less than one-half a gauge. In cutting off finned ends no distinction was made between the rods which were to be used by the maker and those which were to be shipped to outside parties. We carefully watched the bundles and saw that the usual practice of the mill in cutting off finned ends was adhered to.

Data and Results.

General Log.

	First week.	Second week.
Average boiler steam pressure, pounds.....	108.1	108.1
Average gas pressure in chamber, inches...	0.014	0.01
Average draft in stack, inches.....	0.013	0.007
Average temperature of outside air, deg. F.	80.9	76.9
Average temperature gas in chamber.....	1,120	1,210
Average temperature air back end of furnace.	980	950
Average temperature air front end of furnace.	800	890
Average temperature heated air, deg. F....	890	920
Average temperature flue gases.....	610	595

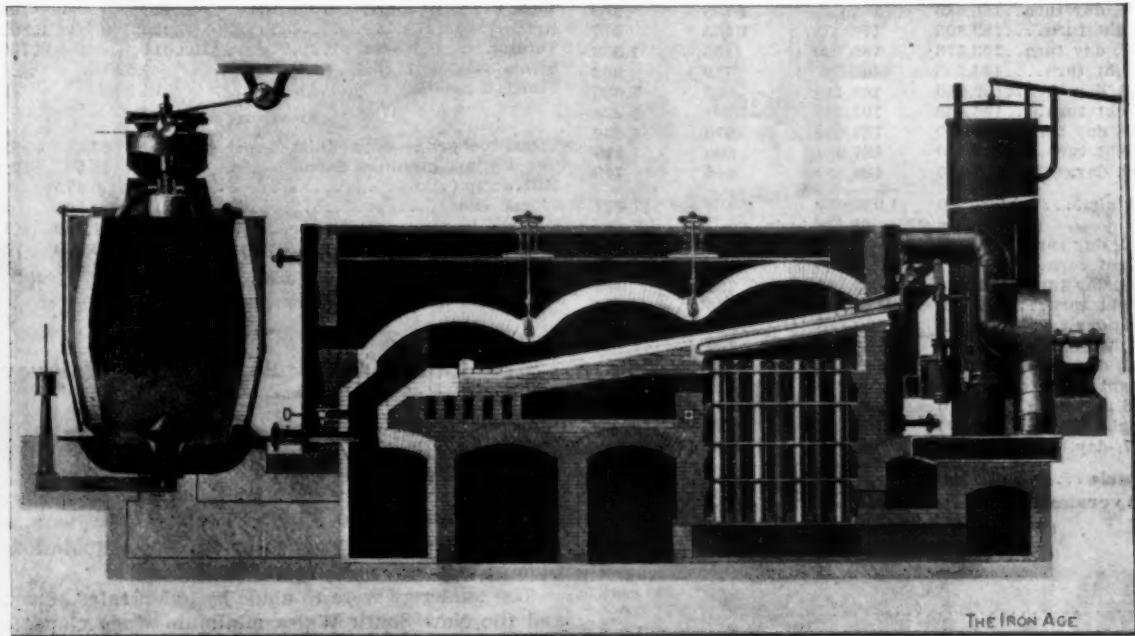


Fig. 2.

THE MORGAN SUSPENDED ROOF HEATING FURNACE.

8 and 9. Observations were taken every hour, as follows:

1. Boiler pressure.
2. Boiler pressure for producer.
3. Gas pressure.
4. Temperature of heated air (at each end of furnace).
5. Temperature of gas.
6. Temperature of flue.
7. Temperature of outside air.

The boiler pressure was read on the gauge of boiler No. 1, which was calibrated.

The pressure of gas was taken through an opening in the manhole cover of the chamber leading from the producers to the furnace. There was a draft at this point, but in the "down pipes" at the openings, where the samples were taken, there was neither draft nor pressure.

The temperature of the gas was taken through the manhole cover by means of a Le Chatelier pyrometer. The temperature of the heated air was taken in two places. Holes were drilled through the cast iron boxes near each end of the side wall, thus avoiding the action of radiated heat. These temperatures were taken with both mercurial and Le Chatelier pyrometers. The temperature and draft in the stack was taken at a point just above the air drum around the stack.

Accidents.

Date.	Working time. Hrs. Min.	Time lost. Min.	Cause.
July 15, day turn.....	11 17	10	Broken billet.
		5	Cobbles.
		3	Reel stuck.
		7	Broken billet.
July 15, night turn....	10 59	5	Cobble.
		4	Mess of rods.
		2	Cobble.
		4	Cobble.
July 16, day turn.....	11 16	5	Broken billet.
		3	Cobble.
July 16, night turn....	11 8	28	" Broken coupling.
		4	Cobble.
		3	Cobble.
July 17, day turn.....	11 6	...	
July 17, night turn....	11 4	...	
July 18, day turn.....	11 8	...	
July 18, night turn....	10 55	...	
July 19, day turn.....	11 7	12	Cut end from rough ing mill got into finishing pass.
		8	Cobble.
		5	Cobble.
July 19, night turn....	11 0	15	Cobble.
July 20, day turn.....	5 40	10	Cobble.
Total.....	118 hrs. 39 min.	2 hrs. 15 min.	

July 22, day turn..... 10	42	3	Cobble.
July 22, night turn..... 11	14	5	Cobble.
		6	Cobble.
July 23, day turn..... 11	10	6	Billet out of guides.
July 23, night turn..... 11	6	3	Rod thrown from guide pipe.
July 24, day turn..... 11	8	4	Billet out of guide.
		3	Low steam.
July 24, night turn..... 11	7	45	Broken billet and broken coupling.
		8	Cobble.
		3	Mess of rods.
July 25, day turn..... 11	0	3	Billet messed.
July 25, night turn..... 10	56	10	Broken coupling.
		8	Cobble.
		12	Cobble.
July 26, day turn..... 11	0	9	Cobbles.
July 26, night turn..... 11	6	6	
July 27, day turn..... 5	43	2	Mess from split billet.
		9	Cobble.
		9	Mess of rods.
Total.	116 hrs. 10 min.	2 hrs. 20 min.	

(Week July 15 to 20, inclusive.)

Time.	Billets used.	Rods.	Mill scrap.	Finned ends.
Pounds.	Pounds.	Pounds.	Pounds.	Pounds.
July 15, day turn..... 178,530	172,415	1,485	935	
Night turn..... 189,180	184,890	1,170	1,125	
July 16, day turn..... 186,585	182,945	1,135	980	
Night turn..... 183,305	178,655	1,155	977	
July 17, day turn..... 192,575	189,190	405	1,053	
Night turn..... 194,595	192,385	719	903	
July 18, day turn..... 192,680	188,410	555	1,035	
Night turn..... 196,450	191,240	791	1,224	
July 19, day turn..... 188,590	184,610	813	1,090	
Night turn..... 192,060	187,960	805	1,215	
July 20, day, 6 hrs. 101,810	100,950	455	740	
Totals.....	1,996,360	1,953,650	9,488	11,277

(Week July 22 to 27, inclusive.)

July 22, day turn..... 182,430	179,220	786	1,030
Night turn..... 201,690	197,140	500	1,276
July 23, day turn..... 200,610	196,230	734	975
Night turn..... 200,330	197,050	835	1,236
July 24, day turn..... 203,950	199,780	520	1,353
Night turn..... 187,430	183,130	762	1,215
July 25, day turn..... 196,930	193,155	985	862
Night turn..... 189,110	186,280	812	1,149
July 26, day turn..... 204,370	200,835	565	960
Night turn..... 201,580	197,895	390	1,327
July 27, day turn..... 103,900	99,980	766	815
Totals.....	2,072,330	2,030,605	7,655

Average Chemical Analysis of Producer Gas.

(Week of July 15 to 20, inclusive.)

New Kentucky Coal.

	Producer gas.	Flue gas.
	Per cent.	Per cent.
O	0.4	9.1
CO	24.5	1.1
CO ₂	3.7	9.2
H	17.8	..
CH ₄	3.6	..
C ₂ H ₄	3.2	..
N	46.8	..
Depth fuel bed.....	3 feet 4 inches.	..
Pressure blowing steam.....	4.7 pounds	..

Gas Coal.

Kind: Illinois New Kentucky, run of mine.

Analysis.

	Per cent.
Moisture	5.08
Volatile matter	37.32
Fixed carbon	50.87
Ash	6.73
Sulphur	1.12

Analysis of Ash.

Ash	95.34
Carbon	4.66

(Week of July 22 to 27, inclusive.)

	Producer gas.	Flue gas.
	Per cent.	Per cent.
O	0.7	8.0
CO	22.9	0.2
CO ₂	4.0	9.2
H	18.8	..
CH ₄	3.7	..
C ₂ H ₄	2.1	..
N	47.8	..
Depth fuel bed.....	2 feet 3 inches.	..
Pressure blowing steam.....	4.7 pounds	..

Gas Coal.

Kind: Ft. Webster, Pa. Ft. Webster gas coal.

Analysis.

	Per cent.
Moisture	0.78
Volatile matter	35.12
Fixed carbon	53.02
Ash	11.08
Sulphur	1.57

Ash	86.36
Carbon	13.64

Results.

	First week.	Second week.
Steel heated, pounds.....	1,990,360	2,072,330
Gross tons.....	891.21	925.14
Finished rods, pounds.....	1,953,650	2,030,695
Gross tons.....	872.16	906.56
Per cent.....	97.861	97.991
Average output of rods per turn, gross tons.....	83.06	86.33
Mill scrap, pounds.....	9,448	7,635
Per cent.....	0.475	0.369
Finned ends, pounds.....	11,277	12,198
Per cent.....	0.565	0.589
Furnace losses, pounds.....	21,945	21,782
Per cent.....	1.099	1.051
Total loss, per cent.....	2.139	2.009
Gas coal, total pounds.....	125,160	110,686
Gas coal per gross ton finished rods, pounds.....	143.5	122.1
Steam coal, total pounds.....	488,640	500,190
Steam coal per gross ton finished rods, pounds.....	560.3	551.7
Average I. H. P. mill engine.....	917	912
Time of running, hours.....	114.5	114
I. H. P. hours.....	104,996	103,968
Average I. H. P. Buckeye engine.....	24	22.31
Time running, hours.....	126	126
I. H. P. hours.....	3,020	2,802
Total I. H. P. hours.....	108,017	106,770
Steam coal per I. H. P., pounds.....	4.52	4.68
Finished rods per I. H. P., pounds.....	18.1	19.0

Summary.

Steam coal per gross ton finished rods, pounds*	560.3	551.7
Gas coal per gross ton finished rods, pounds.	143.5	122.1
Mill scrap.....	0.475	0.369
Finned ends.....	0.565	0.589
Furnace loss.....	1.099	1.051
Total loss.....	2.139	2.009
Per cent. good rods.....	97.861	97.991

*Single cylinder, noncondensing engine.

Steel Rails for New South Wales Railways.

MELBOURNE, August 12, 1901.—No tenders were sent in for the supply of 100,000 tons of steel rails recently called for by the Government.

They were to be manufactured locally and delivered at the rate of 25,000 tons a year for four years, at a price not exceeding English or American quotations at time of delivery, plus freight and charges.

The tenderers were to abide by union rates of wages, and the New South Wales minimum wage clause governing contracts and day labor. These terms appear to have been objected to by English iron makers who were considering the tender. The clause that the price to be paid is "not to exceed, at time of delivery, the lowest selling price in Great Britain or America, plus the usual freight and other charges" was also objected to because of the apparent difficulty of arriving at a definite result as to the price, at the time of each delivery, in the American and English markets.

It was also thought possible that the steel trust of America would bring the price down temporarily to a ruinous figure, with the express object of extinguishing any or all rival companies.

It is expected that the tenders will shortly be called in the usual manner from America and England.

Up to October 2 tenders will be received by the Agent General for South Australia, London, for some 500 miles of galvanized wire netting, 200 miles to be 36 inches wide, 1½-inch mesh, 18 S. W. G., not less than 650 meshes to the lineal yard, and 2000 pounds weight per mile; 300 miles to be 42 inches wide, 1½-inch mesh, 18 S. W. G.; 756 meshes to the lineal yard and 2300 pounds weight per mile.

William Sandford, Australia's one iron master, has floated his business, the Eskbank Iron Works, Lithgow, New South Wales, into a limited company, William Sandford, Limited, of which he is managing director at £1000 a year. Mr. Sandford has been manufacturing iron and steel from the local ore for many years past, and has invested large capital and limitless perseverance in his enterprise. His output of bar iron last year was 7000 tons.

The D'Amour & Littledale Sensitive Drill.

The single spindle sensitive drill here shown is intended for drilling $\frac{1}{2}$ -inch holes and less. It has independent adjustment of the spindle head and lower table, giving it the capacity of a much larger machine. The upper table can be turned out of the way when using the lower table for drilling or centering long work. For a distance of 6 inches above the upper table the machine is capable of drilling to the center of a 16-inch circle. The spindle is driven by a $1\frac{1}{2}$ -inch flat belt. It has three speeds, a cut steel rack and pinion feed, and an adjustable stop to gauge the depth of holes. It is entirely relieved of belt strain and is counterbalanced by a weight inside of the frame, which makes it extremely sensitive and uniform to the touch. It is also provided with means for taking up wear or lost motion and is fitted to No. 1 Morse taper. The machine has the countershaft

or making the steam moist. The boilers are built in units up to 2000 horse-power and for pressures up to 400 pounds.

The British Consul-General at Kiel, Germany, in a recent report to his Government, states that the shipbuilders of that port are so full of orders that 1500 out of the 4000 workmen employed at the yards work overtime. The war and merchant vessels building in private docks in Germany in 1900 were 693 of 763,282 gross tons, an increase of 33,861 tons over 1899. This increase of tonnage is in steamships—there being 403 steamships of 700,848 tons building, against 489, of 662,683 tons gross in 1899; the sailing ships having decreased from 331 of 66,738 tons gross in 1899 to 290 of 62,436 tons gross in 1900. The German ships built in 1900 numbered 447 of 382,070 tons gross (against 523 of 313,060 tons gross in 1899).



Bench.



Column.

THE D'AMOUR & LITTLEDALE SENSITIVE DRILL.

attached to the column and can be placed directly under the line shaft.

Some of the dimensions of the machine, which is built by the D'Amour & Littledale Machine Company of 131 Worth street, New York, are: From the end of the spindle to the upper table, $13\frac{1}{2}$ inches, and to the lower table, 46 inches; from the center of the spindle to the gap in the column, 8 inches, and from the face of the lower column to the center of the spindle, $5\frac{1}{2}$ inches. The adjustment of the spindle head is 13 inches and the throw of the spindle $3\frac{3}{4}$ inches. The upper table is $11 \times 11\frac{1}{2}$ inches and the lower 10 inches.

James Wetherill and Isaac Wetherill, brothers, trading as James P. Wetherill Machine Company, Chester, Pa., have recently taken up the manufacture of the Parker water tube boiler. The principle of the boiler is to maintain a positive flow of water and steam always in one direction, insuring the tubes permanently against the fire and securing safety, providing a free release of the steam, eliminating the effect of bad water, hard firing and falling pressure, doing away with foam, priming and lifting the water under all conditions. A test was recently made where the pressure was reduced 20 pounds instantly without affecting the water level

of which 24, of 99,650 tons, were built in British yards and 38, of 9642 tons gross, in Dutch yards for German owners.

The Armour Institute, Chicago, is arranging for the erection of Machinery Hall, the first of the new buildings to be erected with funds provided by the Armour family in the recent gift of \$1,000,000 to this institution. Machinery Hall will be four stories in height, and will be used for technical instruction in machine shop and foundry work. The first floor will be used as a forge shop, the second floor as a machine shop, the third floor as a pattern shop, and the fourth floor as a foundry. The foundry will be lighted with a saw toothed roof, rendering every part of the room available for the most detailed work. This building will be fully equipped with the most modern facilities for thoroughly instructing the students in all details of the branches taught here. The entire building will be fire proof, mill construction being used exclusively.

An attempt will be made to form a national organization or union of the blast furnace workers in the Mahoning and Shenango valleys at a meeting to be held in Youngstown the first week of October.

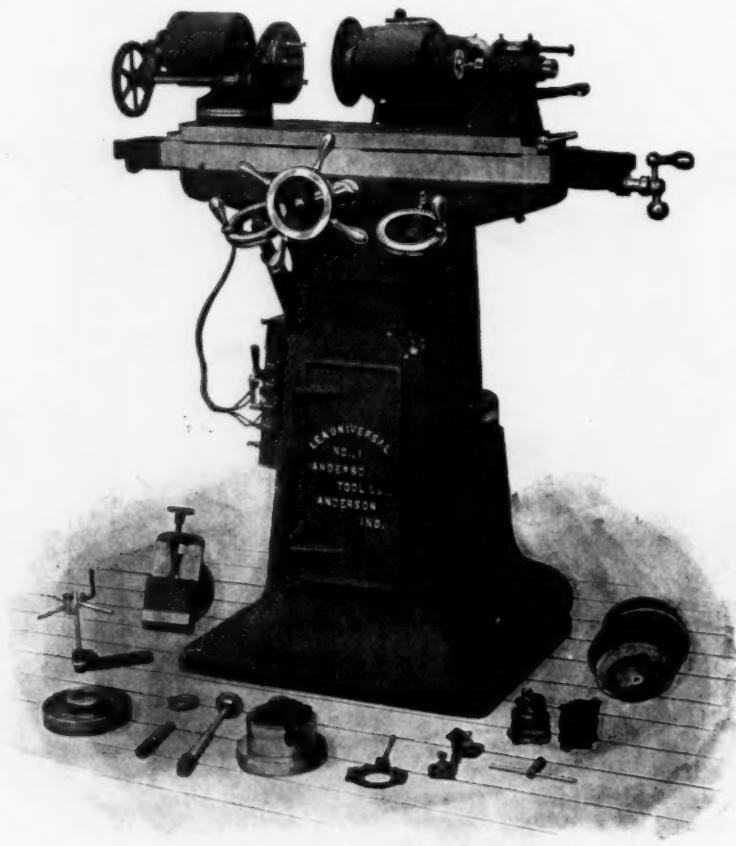
The Lea Universal Grinder.

The Lea universal grinder, built by the Anderson Tool Company of Anderson, Ind., is electrically driven. In this machine practically all work is held between a pair of plain centers or in a vise, and the wheel is moved instead of the work. While the machine is intended more particularly for a cutter and reamer grinder it is adapted for all classes of tool room operations.

The main table has a movement of 24 inches parallel with the bed, and is fitted with swiveling top, graduated to 11 degrees each side of the center, and actuated by a knurled screw. By the use of a turnstile wheel the table is moved by rack and pinion for rapid work, or for cutter grinding. The handle at the end of the table gives micrometer feed for facing work held in the chuck, and is graduated to thousandths. The head stock on which

The head stock is fitted with hardened steel conical spindle run in phosphor bronze sleeves. Provision is made for taking up wear and for holding the spindle when grinding work on dead centers. The head stock swivels entirely around at the base and is graduated 90 degrees each way from center. It is clamped in any position by a single screw. The motor is self contained, self oiling and is easily removable from the machine when not needed. The motor and gear shaft are fitted with bronze boxes. The face plates are two in number; one to revolve with the spindle and carry either a chuck for facing work or to be used in connection with draw in chucks for holding work flat against plate. The other revolves loosely on the spindle. It is provided with drivers and is used where work is ground on dead centers.

The tail stock has a sliding spindle held forward by an adjustable spiral spring and withdrawn from the



THE LEA UNIVERSAL GRINDER.

is mounted an independent motor is swiveled entirely around the circle, is graduated in degrees and works equally well in all positions. The grinder motor takes the wheel on either end. It is mounted in a universal fork, allowing its operation in any position, either vertical, horizontal or any angle.

By the use of the left hand wheel the motor head can be depressed or elevated, allowing a cup wheel to be used for knife grinding, either at right angles with the top table or even with the motor shaft in vertical position. It can be elevated 9 inches for grinding formed cutters between centers, or for larger cutters the wheel shaft may be vertical and grinding be done from the side. The elevating wheel is graduated to thousandths. The right hand wheel moves the grinding motor to and from the center and is also graduated in thousandths.

A cross motion of 8 inches may be obtained and where additional adjustment is needed the fork may be moved in or out of the slide for 4 inches more. For surface work with either a disk or cup wheel the entire width of table and a length of 16 inches may be ground. The wheel column swivels entirely around at the base, is graduated and allows the wheel head to slide at right angles to the center, or at any other angle necessary.

work by a lever. It is clamped to table by a small hand lever and spindle has take up for wear.

The grinding motor is mounted in a double universal joint, allowing it to face in any position throughout the entire circle, either horizontal or vertical. The motor fork is clamped in a sleeve and has an adjustment of 4 inches in addition to table slide. The motor is entirely inclosed on the wheel end, has ball bearings and it is only necessary to use a small amount of grease on it about once in two weeks. This feature is valuable where the motor has to be run vertically, as it is almost impossible to keep oil from working into the winding. The bearings are adjustable from end to end. The motor has five speeds varying from 1800 to 3200 revolutions per minute. It is reversible by switch and works equally well running in either direction. The spindle is $\frac{3}{8}$ inches in diameter and $\frac{1}{2}$ inch where wheel is held.

The main table is heavy and well ribbed on the inside. It runs on one V and one flat guide, is carefully scraped and is provided with self oiling arrangements. It is operated for quick work through a pilot wheel and for slow work and feeding up to work when facing through the small hand wheel, which is graduated in thousandths of an inch. The top table is swiveled on

the center and is graduated and moved in either direction through center point with screw shown at right hand end. Where a greater angle is necessary it can be obtained by swiveling wheel column. The screw may be removed and top table revolved entirely around.

For internal grinding, as shown in Fig. 3, work up to 5 inches in diameter may be held in the chuck on the head stock, turned to any angle and ground to a depth of 4 inches. The smallest diameter of the wheel is $\frac{5}{8}$ inch and the largest 1 inch. The internal spindle is hardened and runs in phosphor bronze bearings. A driving pulley replaces the emery wheel on the motor. This device will grind either taper or straight holes, the taper being ob-

lever not shown in the cut, which takes place of the internal rig. The same operation can be performed on larger cutters by turning the spindle 90 degrees and having the cutter to overhang the side of the table. In this way pieces up to 24 inches in diameter can be properly sharpened.

Tests of Fire Proof Building Material.

An interesting series of tests of fire proof building material was held last week, under the auspices of the Building Department of New York City, in the yard of the Sanitary Fireproofing Company, East 106th street,

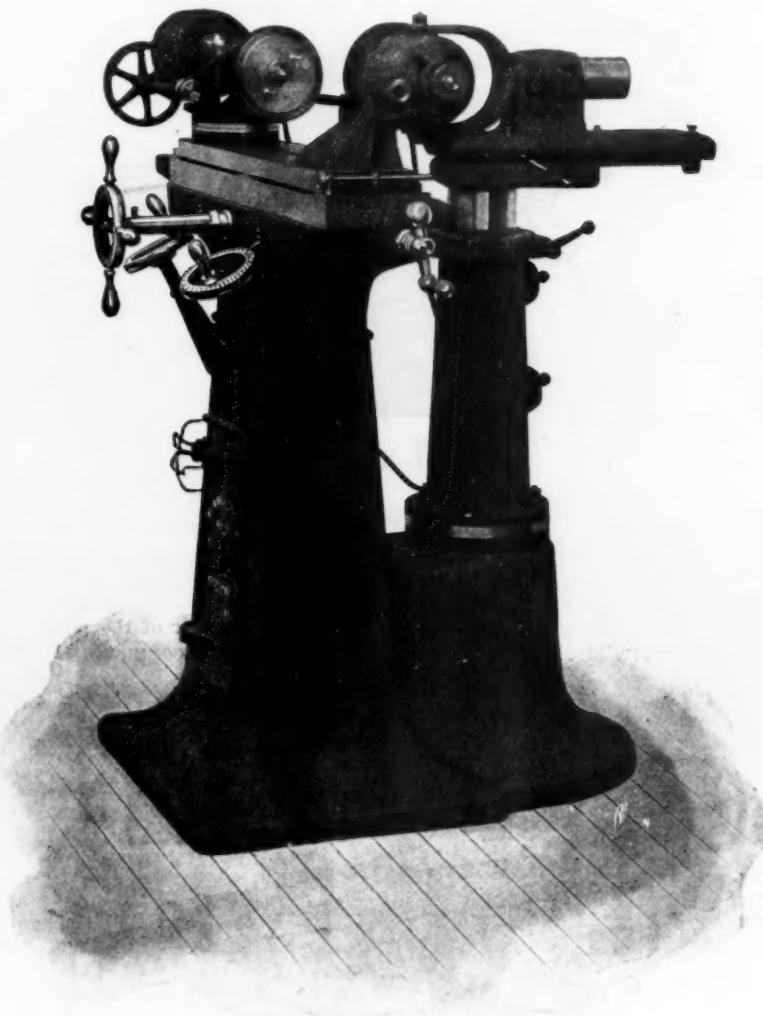


Fig. 2.—Side View.

THE LEA UNIVERSAL GRINDER.

tained by swiveling the table or swiveling the head stock.

When facing work, Fig. 4, in the chuck the wheel motor is swung around in position and the internal grinder removed. The angle of the face is obtained by swiveling the table, swiveling the wheel column or swiveling the head stock. The feed up to the work is by the handle at the right hand end of the machine and is graduated in thousandths of an inch.

The machine will grind a formed cutter, Fig. 5, without special fixtures. In this case it is only necessary to place the cutter on the arbor between the centers, elevate the wheel column and run out the cross slide to the necessary position over the centers and obtain the proper angle by tilting the motor.

Large cutters, Fig. 6, can best be handled upon an arbor fitted in the taper hole in the head stock. The required angle is obtained by swiveling the head stock, table, or wheel column; the clearance by revolving the motor fork and the feed either by hand wheel or by

near the East River, New York. Nine concerns participated. Each manufacturing concern was required to erect a one-story building, 10 feet 6 inches in width and 15 feet 6 inches in length, on a 3-foot brick foundation, the sides and roof to be of the fire proof material manufactured by the concern, with an iron grate resting upon the foundation and an iron or fire proof door in the front and center of the building. Flues and chimneys were also required. In each of the buildings a fire was to be started and kept going for one hour, showing during that time, or a part of it, a heat of not less than 1700 degrees F. At the lapse of the hour a stream of water at a pressure of 45 pounds was thrown into the building, against the sides, for a period of five minutes, in order to show what effect water would have upon the fire proof partitions after having stood the extreme heat.

The test was under the direction of the engineers of the building departments of the boroughs of Manhattan and Brooklyn. The first building to be tested was one erected by the White Fireproof Construction Company.

The fire was started at 10 a.m., and, after going through all the requirements of the test, the building was found to have withstood them, with the exception of a little bulging on one side. The next test was that of the Norman Company building, with almost similar results to the first one. The third was the building of the Metropolitan Company, which was not quite as satisfactory as the others, part of the partition having come down. The fourth test was made on a building erected by H. W. Bell on the Bell system. The showing in this case was good, except a slight bulging of the front partition.

constructed of the Schratwieser metal laths, with plaster in and outside the same, and a door of similar construction. The test of this building was satisfactory beyond expectation. It came out of the test absolutely unharmed.

The Scherzer Rolling Lift Bridge in Russia.

At the initiative of Czar Nicholas II the Imperial Russian Government, under the immediate charge of Prince Khilkoff, the Minister of Public Works and Rail-

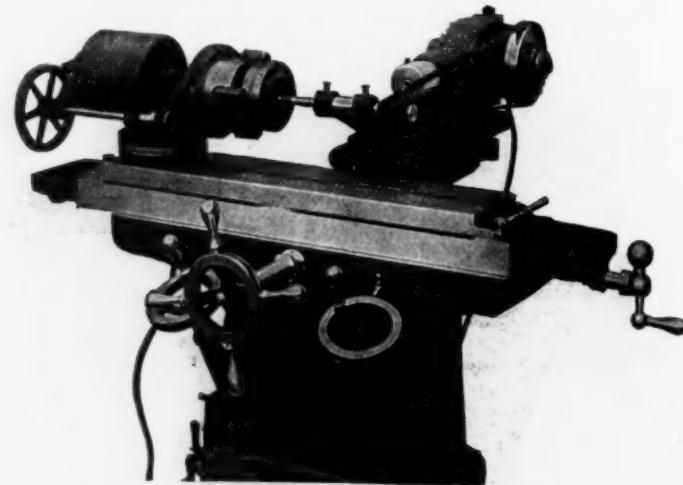


Fig. 3.—Internal Grinding.

The Union Fireproof Construction Company's building was next tested, and was found at the close to be in perfect condition, although the degree of heat at one time exceeded 1900 degrees. The Moslein system, consisting of metal laths plastered on both sides, was next tested on a building erected by Mr. Moslein. The metal

ways, who is well-known in the United States, where he acquired his early professional training by practical experience with the principal American railways for a number of years, has been and is now energetically improving a number of the large rivers within the Empire so as to receive ocean vessels. The Government is also

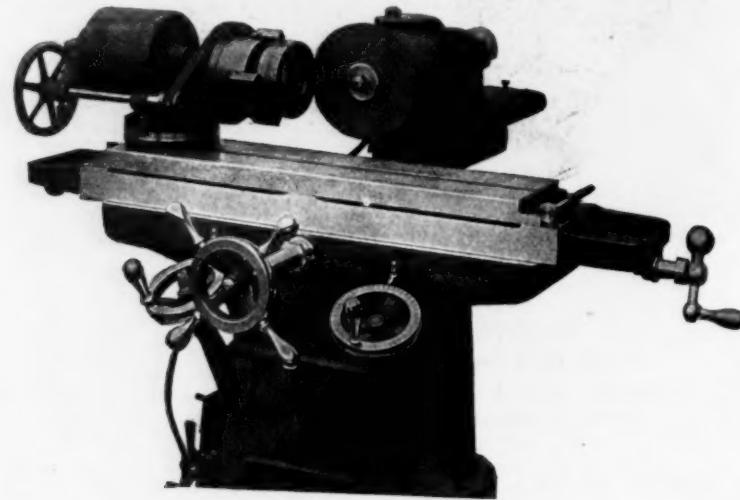


Fig. 4.—Facing Work in Chuck.

THE LEA UNIVERSAL GRINDER.

laths withstood the heat, but the plaster was forced from the laths by the extreme heat. The Brinkman system, which uses material made of solid terra cotta blocks, was the subject of the succeeding test, and, excepting a slight bulging on one side, the building stood it satisfactorily. The Sanitary Fireproof Company building was also tested with equally satisfactory results. The interior of this building was partly plastered with the plaster of the Platt Company, and, while in other buildings the plaster was almost entirely destroyed, it seemed to be hardly affected by the fire. The ninth and last building to be tested was one erected by Jacob Schratwieser of Brooklyn. The building was

enlarging and modernizing its ancient canal and internal waterway systems, originally founded by Peter the Great.

Of greater importance to the people of the United States is the fact that the Government of Russia has vigorously entered upon the construction of several ship canals, which will ultimately form connecting links for the transport of ocean steamships and war vessels entirely within the Empire of Russia, the systems radiating from St. Petersburg. When these canals and waterways are completed modern ocean steamships and war vessels will be able to traverse through the interior of the Russian Empire from the White Sea to the Baltic

Sea, passing through Lakes Onega and Ladoga and the Gulf of Finland; from the Baltic Sea by way of the Duna and Dnieper rivers to the Black Sea; from the Black Sea to the Sea of Azov; and by way of the Don and Volga rivers to the Caspian Sea.

From a naval and military point of view these waterways have become indispensable to the Russian Empire. They will also add enormously to the prosperity and growth of the Empire, as they will form the most economical means of transport for the surplus food products from the interior of the Russian Empire to the adjacent foreign consumers. These great waterways will also enable the economical transport of the foreign goods and manufactures which the Russian Empire now needs for its development.

The growth and development of the Russian Empire during the past 100 years is phenomenal, and is only rivaled by that of the United States, but in population and area the Russian Empire exceeds the United States by more than 100 per cent. Its great and virtually inexhaustible natural resources are just beginning a new era of great development, and the Imperial Russian Government generously welcomes foreign enterprise to assist in the necessary development of the Empire.

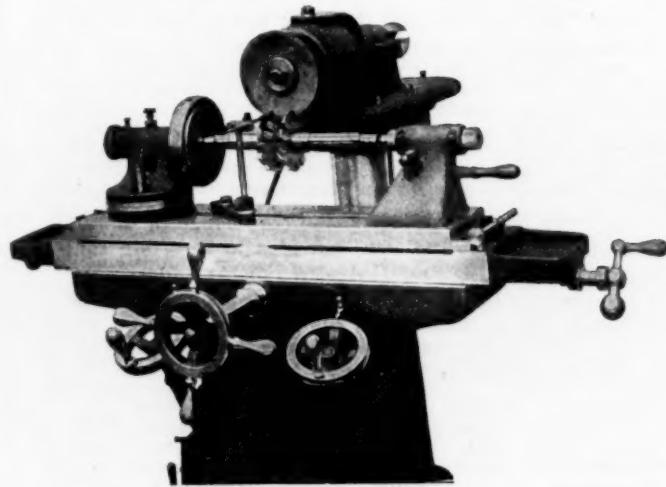


Fig. 5.—*Grinding Formed Cutter.*

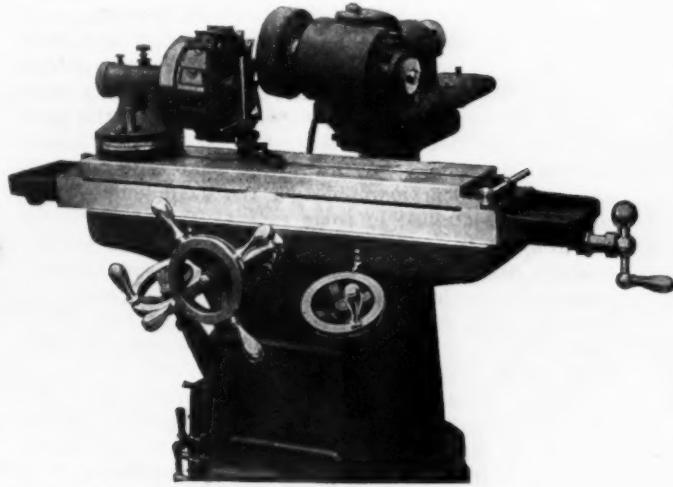


Fig. 6.—*Grinding Side Milling Cutter.*

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The advantages of the Scherzer rolling lift bridges for these great river and canal improvements were brought to the attention of the Russian officials and engineers who visited the United States several years ago with a view of studying and adopting in Russia the most approved methods of railroad, waterway and canal construction. The interests of the Scherzer Rolling Lift Bridge Company of Chicago within the Russian Empire, have now become so extensive as to require the establishment of permanent general offices at St. Petersburg. Eduardovitch O. Gagen, who is a subject of the Russian Empire, and who has for a number of years been connected with Russian Consulates and has made an extensive study of American institutions, engineering and business methods, has been appointed a special representative of the Scherzer Rolling Lift Bridge Company for the Russian Empire, and is now on his way to Hamburg, Germany, from which port he will proceed to Russia. After visiting all of the important seaports and waterways of Russia Mr. Gagen will return by way of the Trans-Siberian and Chinese Eastern railroads. He will then visit a number of the principal seaports and cities in Japan, with a view of further developing the business of the Scherzer Rolling Lift Bridge Company already established there. It is expected that his mission will require about a year.

The Elizabeth Brass Foundry Company.—The Elizabeth Brass Foundry was started at Elizabeth, N. J., about two and one-half years ago. It has recently be-

come necessary to enlarge the plant in order to accommodate the amount of business that was being done. To this end a new foundry building of the usual construction, 50 x 50 feet, has just been erected. This will be thoroughly fitted up to do all descriptions of light and heavy work in brass, copper and also in aluminum, for which latter the concern find a good demand. With the completion of the new foundry the business style of the concern was changed from "Elizabeth Brass Foundry" to "Elizabeth Brass Foundry Company," the former partnership between Chester M. Whitney and Charles C. Bussey being dissolved, and a stock company formed with Charles C. Bussey as president and Chester M. Whitney as secretary and treasurer.

Philadelphia Foundrymen's Association.

The one hundred and tenth regular meeting of the Philadelphia Foundrymen's Association—the first meeting after the summer recess—was held at the Manufacturers' Club on Wednesday evening, September 4, at 8 o'clock p.m. The chair was occupied by Thomas I. Rankin, president, who in calling the meeting to order welcomed those present and expressed his gratitude at the

reassembling of the many familiar faces. Among those present may be mentioned:

Thos. I. Rankin, Abram Cox Stove Company, Philadelphia.
James I. Stirling, Harlan & Hollingsworth, Wilmington, Del.
P. D. Wanner, Reading Foundry Company, Reading, Pa.
S. G. Flagg, Jr., S. G. Flagg & Co., Philadelphia.
A. I. Colby, Bethlehem Steel Company, Bethlehem, Pa.
Jas. V. Umberger, Bethlehem Steel Company, Bethlehem, Pa.
W. H. Mitchell, Bethlehem Steel Company, Bethlehem, Pa.
H. L. Haldeman, Pulaski Iron Company, Philadelphia.
Wm. Hamilton, Harlan & Hollingsworth Company, Wilmington.
Oregon J. Ward, Howe Scale Company, Philadelphia.
L. A. Hickley, Davis Coal & Coke Company, Philadelphia.
H. C. Du Bois, Matthew Addy & Co., Philadelphia.
Geo. Benkart, G. Rebman & Co., Philadelphia.
Edgar Arnole, Orr, Painter & Co., Reading, Pa.
Edgar S. Cook, Warwick Iron & Steel Company, Pottstown, Pa.
A. E. Outerbridge, Wm. Sellers & Co., Philadelphia.
C. S. Koch, Wm. Sellers & Co., Philadelphia.
A. A. Miller, *The Iron Age*, Philadelphia.
Thos. Hobson, *The Iron Age*, Philadelphia.
August Williams, Enterprise Mfg. Company, Philadelphia.
H. O. Evans, Thos. Devlin & Co., Philadelphia.
T. B. Harkins, Harkins Foundry Company, Bristol, Pa.
Geo. C. Davis, chemist, Philadelphia.
Geo. C. Davies, Pilling & Crane, Philadelphia.
Paul Vanfleet, I. A. Sheppard & Co., Philadelphia.
Chas. T. Hoibrook, Philadelphia.
C. D. Matthews, Camden Iron Works, Camden, N. J.
Wm. Hanson, Pennsylvania Iron Works Company, Philadelphia.
A. J. Wright, Abram Cox Stove Company, Philadelphia.
John A. Clark, Clark Iron Foundry, Philadelphia.
Howard Evans, J. W. Paxson Company, Philadelphia.

The reading of the minutes of the previous meeting was dispensed with in the usual manner. The report of

the treasurer showed a balance of \$2000 in the treasury, with all indebtedness paid.

The application for membership of the Downington Mfg. Company, East Downington, Pa., was presented, and on motion the secretary was instructed to cast a favorable ballot.

Under new business the papers before the association for the evening were presented, and consisted of one on "The Tropenas Converter Steel Process," by A. Tropenas, Paris, France, copies of which were distributed among those present, and a paper on "Machine Cast Pig Iron," by Albert Ladd Colby, metallurgical engineer of the Bethlehem Steel Company, South Bethlehem, Pa.

A short discussion of Mr. Colby's paper followed, in which, in answer to a question from Mr. Davis whether there is any material change in the grain of machine cast general foundry iron, with manganese at 0.3 and at 0.8 per cent, Mr. Colby stated that that variation in manganese should not have a very marked effect as regards the fracture, but it would be safer to determine definitely in all cases by chemical analysis. Mr. Flagg asked whether the jarring of the mold in casting machine cast pig iron does not interfere with the grain of the iron. Mr. Colby admitted that it does, if the jarring occurs before the iron reaches the point of solidification.

Edgar S. Cook, Warwick Iron & Steel Company, said that his company had adopted the practice of machine casting after careful inquiry and study. He read a number of letters from foundrymen in support of the good working qualities of the machine cast pig iron manufactured by them. Mr. Cook said that with uniform ores and uniform manipulation the grain of the iron could be maintained to some extent. In their practice the iron, after pouring in the molds, was left several minutes before being watered, and he showed several samples of machine cast pig which would approximate 3 per cent. silicon, 0.02 per cent. sulphur and manganese under 0.5 per cent., and which did not show any chill effect on the edges.

Thos. I. Rankin insisted that every furnace man manufacturing machine cast pig iron could overcome the objections of the foundrymen to the same by an honest shipment of iron—suitable just for the particular work it was being bought for—and further said that in his opinion the time was not far distant when machine cast iron would be generally used. After a vote of thanks to Mr. Colby for his able paper the meeting adjourned.

Luncheon followed on the roof garden of the club. President Thos. I. Rankin acted in his usual happy manner as toastmaster, and called upon Messrs. P. D. Wanner, A. L. Colby, E. S. Cook, A. Williams and others in turn, each of whom responded in an interesting manner.

The Elinor Iron & Steel Company.—The Elinor Iron & Steel Company have been organized under the laws of New Jersey with a capital stock of \$150,000, the incorporators being Clifford W. Perkins, August S. Meeker and Kenneth K. McLaren. The company have purchased 20 acres of the old Penn American Glass Company's property at Irwin, Pa., and have started the building of 36 puddling furnaces, one train of three-high muck rolls, one 16-inch three-high finishing train, and one 12-inch three-high finishing train. The company will manufacture iron and steel merchant bars and skelp, the general manager being Allan Wood Smith, former manager of the Keystone Rolling Mill of Pittsburgh. We are advised that all the contracts for the machinery have been made.

In July the imports of pig iron into the United Kingdom from the United States amounted to 319 tons, as compared with a maximum of 12,847 tons in January, 1901. The imports of "unwrought steel" were 65 tons in July, compared with the maximum of 16,647 tons in January, 1901.

The claim that the Republic Iron & Steel Company, through their labor commissioner, James H. Nutt, had

been asked by the Amalgamated Association to sign the scale for five years, is denied. It is probable, however, that when the time comes next year to arrange the wage scale the Republic Iron & Steel Company will ask that the Amalgamated Association make itself an incorporated body, in order that the contracts entered into between the two would have legal standing in a court of equity.

Some Chemical Changes in Malleable Iron After Annealing.

BY J. HOWARD, DUQUESNE, PA.

The object of the work described here was to determine some of the changes that took place in a white iron casting after having been annealed. The sample bar was taken about the time half the heat was run out of the furnace and was 16 inches long, 2 inches wide and 1½ inches in thickness. The piece from which a sample was broken for "white iron" analysis was annealed in the same pot with a lot of brake heads and fulcrums, whose maximum thickness was not an inch. When the castings were sufficiently annealed the sample was broken in two, and one part marked "first anneal" for analysis, and the other put in with a fresh lot of castings and annealed for a second time.

An analysis of the "white iron" resulted:

Analysis of White Iron.		Per cent.	Per cent.
Silicon	0.84	Total carbon	2.30
Sulphur	0.051	Graphitic carbon	0.16
Phosphorus	0.202	Manganese	0.44

In order not only to determine the change in the annealed from the white iron, but also to ascertain that taking place in the annealed piece, inside and surface, a sample was taken from the surface, about ½ inch in thickness, by a planer, and another sample from the core, along its greatest dimension by a drill. Analysis yielded the following results:

Outside	Outside	layer.	Core.	layer.	Core.
Silicon	0.84	0.84	Manganese	0.45	0.44
Sulphur	0.090	0.053	Total carbon	1.39	....
Phosphorus	0.18	0.018	Graphitic carbon	0.64	....

These four elements do not differ much from their original per cent. in the white iron. The outside layer of the piece annealed the second time was the same thickness as that of the first anneal and showed the following composition:

Outside Layer, Second Anneal.	
Silicon	0.75
Sulphur	0.096
Phosphorus	0.22
Manganese	0.55
Graphitic carbon	0.193; by HNO_3 , 1.13 sp. gr.
Graphitic carbon	0.203; by HCl , 1.12 sp. gr.
Total carbon	0.29

A comparison of these with the previous results show a great change, especially in the carbon, which was given off as carbonic acid or a complex carbide. That termed "graphite" is not so strictly speaking, but "temper carbon," and is quite difficult to burn off. The sulphur is another important factor, having increased from 0.051 in the white iron to 0.096 during the two annealings. The pieces were packed in mill scale and lathe turnings and the sulphur was probably absorbed from that source, although no analyses were made of the packing. The sample was cast and annealed at the Sterlingworth Foundry at Easton, Pa.

A. Sorge, Jr., & Co., 1019 and 1021 Monadnock Block, Chicago, have arranged to exhibit in operation at the Milwaukee, Wis., Industrial Exposition, from September 7 to September 28 a Sorge chemical feed water purifying system in connection with a Cochrane feed water heater. They will also show Cochrane steam separators, Cochrane oil separators, Flinn differential steam traps and Sorge registering drainers. Sorge systems have now been installed and are in operation on over 200,000 horse-power of boilers, giving their users complete satisfaction.

The Federal Industrial Commission.

An Analysis of the Evidence.

WASHINGTON, D. C., September 10, 1901.—The Federal Industrial Commission has compiled a critical and analytical review of the evidence given before it by the representatives of a number of the principal industrial combinations in the United States, more attention being paid to the United States Steel Corporation, however, than to any other company. The review is designed for transmission to Congress, and will be accompanied by a report in which specific recommendations for legislation to correct such evils as the Commission finds to exist will be made.

The analysis of the testimony of the various witnesses is specially interesting as indicating what features of the evidence particularly impressed the Commission, and also as foreshadowing to some extent the suggestions that will be made with reference to Congressional action. In this connection it is significant that considerable space is devoted in the review to a discussion of the capitalization of the United States Steel Corporation, from which some interesting deductions are made.

The Commission finds that the chief cause of the formation of industrial combinations has been excessive competition; that naturally all business men desire to make profits and first find their profits falling off through the pressure of lowering prices on the part of their competitors. The desire to lessen too vigorous competition naturally brings them together. The declaration so frequently made that the protective tariff is the chief cause of the trusts does not appear to be borne out by the evidence taken. Only one or two witnesses have considered the protective tariff as the chief cause of the trusts, and while a few have stated their belief that the tariff has some influence toward encouraging combinations the great majority are opposed to this view.

Savings by Consolidation.

Referring to the savings to be effected by consolidations the Commission says:

"a. Among the economies that are generally recognized as resulting from combination is the regulation of production. Where there is no general understanding among producers there is a strong tendency to overproduction, so that markets become demoralized and competition excessive. The combination is able to so fit the supply to the demand that while customers can be fully supplied at reasonable prices there is no danger of overproduction. It is thus a means of preventing panics and periods of depression.

"b. Closely allied with this adaptation of supply to demand is the advantage that comes from the possibility of carrying much smaller stocks of goods. This saves not merely the investment of capital, but also interest on running capital, insurance, storage charges, shop work, charges, &c.

"c. This same control of production enables the combination to keep its factories running full time, thus keeping labor fully employed. It has been found in several special cases that the percentage saved in the cost of production by running a factory full time instead of half time was from 4 to 8 per cent. In other cases it is doubtless more.

"d. When a large proportion of an industry is under the control of one central management it becomes essential to success that the various products be standardized. In this way the quality of goods can be made much more uniform than would otherwise be the case, and its excellence can be guaranteed. Furthermore, the number of styles of goods can regularly be very much reduced, thus lessening the cost of manufacture and effecting a saving in the amount of stock that needs to be carried.

"e. The same influence leads to the larger use of special machinery, and to the adaptation of the workmen and the superintendents to the special departments for which they are best suited. In many cases through this specialization more can be saved than through the introduction even of new machines. In one case as much

as 20 per cent. of the cost was saved by thus specializing the machinery. Mr. Schwab, president of the United States Steel Corporation, mentions the specialization and adaptation of materials as a great saving in the steel industry."

Material savings are also made in the cost of selling, advertising, &c., as well as through a better knowledge and control of credit conditions. In addition there is a noteworthy saving in many instances through shipping goods to customers from the nearest plants, and large combinations also make special gains by being able to ship exclusively during seasons when water transportation furnishes competitive routes.

Capitalization.

Taking up the subject of the proper basis of capitalization for a large corporation, the review says:

"Before one can justify a high capitalization by the mere fact that dividends can be paid on it, one would perhaps need to inquire in some cases at least the source of power to secure these high earnings. If it were a monopoly power some would not consider the high capitalization justified. Another interesting question in connection with capitalization was raised by Mr. Schwab in connection with the United States Steel Corporation. Whether that company were to be considered as overcapitalized or not depended largely, in Mr. Schwab's judgment, upon the value that was to be placed upon their unmined ores and their coking coal. He thought, also, that the value of the ore and coal ought to be considered as considerably greater than the fact that the supply of Lake Superior ore and of Connellsburg coking coal was apparently limited and, so far as one could judge from the present outlook, would be exhausted within a comparatively few years. It should be noted that the addition of large capitalization representing values of unmined ore is not usual, although it has doubtless a certain basis of justification. If we grant that a materially added value comes from the fact that the supply is limited, and that the United States Steel Corporation are to get the benefit of this limited supply by virtue of the fact that they own some 80 per cent. of the Lake Superior ore in sight, this is a capitalization which may possibly be entirely proper, but which is clearly a capitalization of natural monopoly.

"The capitalization of the United States Steel Corporation is \$74,373,035 more than the total capitalization of the separate companies of which they were at first formed, not counting the Carnegie Company nor the companies taken in since the organization. From the testimony given by the officers of several of these separate companies their capitalization was also materially greater than their tangible assets. Mr. Reid testified that of the \$28,000,000 of common stock and \$18,000,000 of preferred stock entering into the capitalization of the Tin Plate Company, the \$18,000,000 preferred were supposed to represent the cash value of the plants as going concerns, including good will. All of the common represented good will, hope of future success and pay of the promoter. He stated further, however, that owing to the fact that the establishments were bought as going concerns at a time when business was prosperous, and when some of the vendors doubtless felt that they were in a position to make good terms, the prices for which they sold were high; so that all the stock taken together would represent probably three or four or five times the cash value of the plant itself under ordinary conditions.

"The National Steel Company, according to the testimony of their president, Mr. Reis, had the value of their plants fairly accurately represented by their preferred stock, \$27,000,000; the common stock, \$32,000,000, being all for good will, expectation of profit and the pay of the promoter. From the testimony of other officers the implication is that the capitalization of the American Steel Hoop Company, with \$14,000,000 preferred and \$19,000,000 common, was divided on substantially the same basis, and the same plan, it is generally understood, was followed in the organization of the American Sheet Steel Company.

"According to the testimony of Judge E. H. Gary, the capitalization of the Federal Steel Company at \$98,000,000 represented the actual value of the properties and

cash. He stated, however, that \$31,000,000 of that valuation was increase, not appearing in the book values of the separate companies. That increase represented mainly increased values of the properties since that had been held by the constituent companies. For example, some coal land was put in at \$500 an acre, of which some had been sold just before the time when he gave his testimony at \$1000 an acre; the Illinois Steel Company had one iron mine that cost about \$75,000—they had just been offered \$600,000 in cash for it—and similar matters of that kind. It will be seen that in this way a part of this actual valuation of \$98,000,000 (\$31,000,000) was in the form of mines, real estate, &c., part of which, of course, was not immediately productive, but which it was supposed at that time had an actual cash value of the amount named.

"Mr. Gates, at that time chairman of the American Steel & Wire Company, testified that of their capitalization of \$90,000,000 probably \$50,000,000 to \$60,000,000 might be considered as value of plants, and \$10,000,000 or \$15,000,000 were issued as good will. As showing the increased and increasing value of such property he stated that the demand for steel cars, steel vessels and steel frames for buildings and bridges constituted as large a demand in tonnage as the total tonnage of the United States in iron and steel 15 or 20 years ago.

"From the testimony offered by these different witnesses it will be seen that in October, 1899, the actual cash values of most of the plants entering into the United States Steel Corporation (including the National Tube Company on the same basis as the American Tin Plate Company) were placed by the officers themselves of those companies at their very conservative estimate of \$298,570,200, leaving \$158,500,000 as good will. That capitalization has been increased by \$74,373,035, making a total of \$232,873,035 for good will in the broad sense, provided there had been no increase in the value of the tangible assets. On that question some considerations are given below.

CAPITALIZING GOOD WILL.

"A fairer basis of comparison between the separate companies than the above would be that made in substance by the United States Steel Corporation themselves in purchasing the shares of the different companies. The shares of the Federal Steel Company, the American Steel & Wire Company and the National Tube Company were all of them taken at somewhat lower rates than those of the National Steel Company or the American Tin Plate Company. From the testimony already cited it seems that in the case of those two companies all of the common stock at any rate, and probably considerably more, was to be considered as issued for good will—*i. e.*, expectation of earnings. On that basis, as has often been assumed without allowance for increase in values, during the last two years, taking all of the common stock of all of the companies purchased by the United States Steel Corporation, with the exception of the Carnegie Company and the Lake Superior Consolidated Mines, neither of which had any preferred stock, it will be seen that the good will in the constituent companies amounts to \$270,835,100. If we may also assume that the added common stock is to be considered as good will, and add this to the sum mentioned above, it results that the good will of the consolidated companies amounts to \$302,118,963, or, if one were even to include the added preferred also, it would amount to \$380,918,111. If we were to take the price of the stock of the Lake Superior Consolidated Mines as a criterion of the value of that stock before it entered into the consolidation, it would appear that more should be added, but regarding that we have no definite basis for comparison and therefore omit it entirely except as regards the increase. It should be kept in mind, however, that the testimony on which these statements are based refers to conditions of nearly two years ago.

"It is, of course, true that there are increased values of the properties, because they have doubtless since the earlier date added materially to their plants and cash on hand, and there has doubtless been also added value given to the values of the plants by the prosperous conditions of the last two years. How much is to be so reck-

oned, how much is to be credited to good will or actual earning capacity, of course is a matter for individual judgment, but according to officers of the Steel Corporation themselves not less than \$175,000,000 have been added in actual values since the testimony of the officers of the different plants referred to was given. It has been testified also that in certain cases good will alone in its narrow sense is of more value than all the tangible assets of an establishment.

THE CARNEGIE PROPERTIES.

"There is no evidence before the Commission and there has been no published statement showing the issue of stocks and bonds paid for the Carnegie properties. In a circular letter issued by J. P. Morgan & Co. March 2, 1901, it was stated that the 'bonds of the United States Steel Corporation are to be used only to acquire bonds and 60 per cent. of the stock of the Carnegie Company.' It has been frequently stated, though not published on authority, that the bonds were exchanged at par, and that Mr. Carnegie received \$1500 in bonds for each \$1000 of his Carnegie stock. At these rates he would have received for

Bonds of U. S. Steel Corporation.	
\$160,000,000 bonds.....	\$160,000,000
\$96,000,000 stock at 150.....	144,000,000
Total.....	\$304,000,000

"As this sum agrees exactly with the amount of bonds issued, it seems a reasonable interpretation.

"It is generally supposed that most of the remainder of the Carnegie stock was taken at 150 preferred stock with an equal bonus of common, though some little was bought for \$1200 or \$1300 cash. Assuming all taken at the first rate, and that \$25,000,000 cash was raised with \$25,000,000 par of preferred with equal bonus of common, a generally accepted inference, the remainder of the Carnegie holdings and the cash would have cost as follows:

	New stocks.	
	Preferred.	Common.
For \$25,000,000 cash.....	\$25,000,000	\$25,000,000
For \$64,000,000 Carnegie stock at 150	96,000,000	96,000,000
	\$121,000,000	\$121,000,000
Stocks of the nine companies.....	336,581,848	342,567,019
Total to pay for purchases....	\$457,581,848	\$463,567,019

"Taking these sums, which, as will be seen, are partly estimates, known to be not quite accurate, but probably too large, from \$550,000,000 each of preferred and common, the total amount authorized, there is left for the pay of the syndicate and as treasury stock to be used in future:

Preferred	\$92,418,152
Common	86,432,981

COST OF RAW MATERIALS.

Referring to the cost of raw materials, the Commission says:

"It is noticeable that since the organization of the United States Steel Corporation they have fixed the price of Lake Superior iron ore at \$1.25 less per ton for the season of 1901 than was paid during the season of 1900. Of course, owning as they do something like 80 per cent. of the ore, it is practically within their power to fix its price for the general market. Mr. Schwab in his testimony did not give the reasons for fixing the lower price beyond an intimation that this fact showed that there was no attempt at securing excessively high prices. Possibly one further element is to be found in the fact that the United States Steel Corporation are also purchasers of crude iron, and that there may be in this a certain element of reciprocity. The general belief in Europe, and the belief that seems to be spreading here also, is that the larger industrial combinations will find it to their interest and also within their power to prevent to a considerable extent either speculative advances or reductions in the prices of raw materials. Any steady effect in that direction would materially advance the general interest of manufacturers as well as consumers. The experience of coal producers and iron manufacturers of Europe seems to show that the combinations have, at any rate, the opportunity to perform this service for the public."

No Absolute Monopolies.

Concerning the extent to which various combinations control the industries in which they are interested, the Commission finds that there are practically no absolute monopolies. Concerning the United States Steel Corporation, it says: "This corporation are made up of companies engaged in various lines of business, from mining to finished higher grades of steel. It is probable that at the present time they control between 65 and 75 per cent. of the steel industry of the United States. In very prosperous times the percentage would probably be smaller, in very dull times it would be very much larger."

With regard to the effect of combinations upon the prices of product, the report says:

Combinations and Prices.

"It is perhaps natural for the combinations to attempt to take credit for any decrease in the price of their finished product, stating that this decrease has come about from the various economies which have been made by the combinations, and from their willingness to be reasonable in their dealings with the public; or to cite instances of decrease in price as showing that although they may have a large amount of capital they are still subject to competition and are unable to control prices.

"On the other hand, when prices in products manufactured by the combinations have increased, it is not unusual for them to call attention to the conditions of the market which have brought about this increase, as, for example, a very largely increased demand for the product, or increase in the price of the raw material, or increased wages, or some other similar factor.

"The testimony of substantially all of the combination men is to the same effect—that unless a combination has either some natural monopoly of the raw material, or is protected by a patent, or possibly has succeeded in developing some very popular style or trade-marks or brands, any attempt to put prices at above competitive rates will result eventually in failure, although it may be temporarily successful. On the other hand, by securing control of trade-marks, or by creating a demand for certain brands through skillful advertising, very material advances in prices may often be made.

"In the case of the iron and steel industry the general impression seems to be that so far, at any rate, it has not been possible for the combinations to maintain prices materially above what the market conditions would justify. It is doubtless true that in many cases, even earlier, there have been temporary combinations, pools, in certain lines of industry which have kept prices up, but these have ordinarily been short lived. If prices are advancing, the pools stand; if prices fall, they go to pieces.

"The very great increase or decrease in the prices of iron and steel seem to be due rather to other causes. Mr. Butler of Ryerson & Co. says, for example, that the extreme fluctuations to which the iron and steel market have been subject seem to be due largely to the fact that the middlemen, whenever there comes an increased demand, fear that there is going to be a scarcity, and so call for more than they really need, in this way making a demand that is abnormal. In order to meet this apparent demand and check it, the output is increased and prices are raised beyond what would otherwise be justified. When at length it is found that there has been an oversupply made ready for the market, prices begin to fall, and these same middlemen, fearing that they will be caught with too large stocks on hand, cut prices until they fall below what the market conditions would really justify. In his opinion, apparently, as well as in that of many of the men associated with the combinations, the effect of a great combination would be rather to prevent these abnormal fluctuations than either to increase or to decrease materially the general average prices. The power of the combinations, in the minds of most of these men, depends to a considerable extent upon the condition of the market. When there is a depression in prices a combination controlling, as do the United States Steel Corporation, from 65 to 75 per cent. of the output would not be able to fix prices to any con-

siderable extent. When, on the other hand, the demand was so great that all establishments were running full, they could aid in steadyng prices or in fixing a rate beyond which none could go. None of the steel manufacturers seems to think that there is any danger of monopolistic control of prices from the existence of the United States Steel Corporation.

"The charge has been very frequently made that the great combinations are able at times to follow their smaller competitors into local markets, to make prices very low there in order to ruin their rivals, then to recoup themselves by higher prices in the general market. Such a course of procedure is generally looked upon as an unfair method of competition. So far as evidence has been taken before the Commission it does not seem that this practice has been followed by the steel manufacturers."

Concessions in Export Business.

The Commission devotes a good deal of space to a discussion of export prices and the reasons for making them lower than for similar goods sold at home. Referring to the iron and steel combinations in this connection the review says:

"It has been frequently stated that the prices for goods for export are considerably lower than those for the home markets. This is charged against the combinations as a business practice that is not justifiable, and in some instances it is claimed that the protective tariff aids the trust in this practice. On the other hand, not merely the managers of the combinations, but other business men, claim that the practice is justifiable on sound business reasons in the interests of the laborers and consumers as well as of the manufacturers, and that it is one that is practically universal in all countries.

"Mr. Schwab, president of the United States Steel Corporation, says that during the last year that corporation exported certain grades of steel at about \$23 per ton, when the price of the same goods to home consumers was from \$26 to \$28 per ton. The reason for the lower prices was that it was desirable to keep the plants running at full capacity. The home demand was not enough to do this. It was not possible to dispose of the surplus at the home price. In consequence a price was made that would sell the goods. He says that this custom has been general among steel manufacturers in circumstances of that kind. Moreover, if the plants were not kept running to their full capacity the cost of production would be so much increased that the price to the home consumer would on the whole be higher than if these export goods were sold at the lower rate. Aside from that fact the laborers would not be kept employed, and it might even be necessary to cut the wages of those who were working. He considers the working people the chief beneficiaries of all measures taken to increase export business. The sellers of supplies will generally make specially favorable prices for goods to be used in the export trade; the railroads will carry export goods cheaper; but the working people get the same on export products as on those for the domestic market.

"Mr. Butler, an iron merchant in Chicago, says that this principle of selling goods for export lower than to home consumers applies not merely to foreign sales, but is practically a universal custom even within the home market. A manufacturer in Chicago, for example, will make, relatively speaking, lower prices to the purchaser in Omaha than to one in Peoria, to one in Denver than to one in Omaha, and to one in San Francisco than to one in Denver. The reason for this is not merely that given by Mr. Schwab, but, still further, the fact that every dealer is anxious to extend his sales, and will make whatever sacrifices are necessary to get the market so long as he is not working at an absolute loss. The further he goes the greater his expenses are and the greater the pressure there is on him; consequently the lower his prices.

"Mr. Hopkins, president of the Sloss-Sheffield Iron & Steel Company, says that ordinarily his company have been getting about the same price on their export shipments as on domestic sales. He believes, however, that

It is justifiable to sell abroad at lower prices rather than to shut down any American mills.

"Mr. King, vice-chairman of the Jones & Laughlins, Limited, agrees with the statements of other manufacturers regarding the general practice of exporting at lower rates than are secured for domestic sales. During the last year or two, although they have exported much, they have sold at \$1 or \$2 a ton below the domestic price, most of the difference being made up by the greater cost of delivering to the foreign market."

Trusts and the Tariff.

The oft repeated statement that the tariff is responsible for the so-called trusts is discredited by the Commission's review of the evidence before it, although some testimony is said to have been adduced tending to show that the tariff enabled manufacturers to secure considerably higher prices than they would otherwise obtain and sometimes prices not justified by the cost of materials, labor, &c. Several witnesses claimed that the trusts have only an incidental relation to the tariff, and reap no more benefit from it than the so-called independent manufacturers.

"In certain instances," says the Commission, "as, for example, in the case of Mr. Schwab, it is thought that in certain lines in which there is comparatively little labor employed the tariff is no longer needed, and that it might be removed without detriment, but these same witnesses are of the opinion that in the cases of manufacturers of higher grade, in which there is much labor employed a reduction of the duties resulting in European competition would necessitate a reduction in wages. In most cases the manufacturers were of the opinion that so little damage, if any, was done by the tariff that it would be unwise to take the risk of disturbing the present prosperous condition of industry by a discussion of any changes in the tariff."

Consolidations and Labor.

An interesting feature of the review treats of the relations of the combinations to labor, both in the matter of wages and the recognition of the unions. On these points the Commission says:

"Speaking generally, the witnesses have been of the opinion that the effect of the combinations has been to increase wages, or, at any rate, that during the last two or three years under the combinations the wages have been somewhat higher than they had been before. It is acknowledged in many cases that this increase has been due to the prosperous condition of the country and to the fact that there has been a strong demand for labor. In most cases in the iron and steel manufacture, as well as in several other of the most important industries, the wages are arranged after consultation with the labor unions and with committees representing the employees and a scale is agreed upon, in many cases this being a sliding scale dependent upon the price of the product."

"Mr. Schwab, president of the United States Steel Corporation, referring to the experience of the Carnegie Company in the strike of 1892, stated his opinion to be that on the whole the labor unions were detrimental to the interests of the laboring men, inasmuch as they tended to check the opportunity for individual effort and to prevent the full development of excellence and power on the part of the individual workmen that otherwise might be secured. He said that in the Carnegie works, although some of the highest priced workmen under the union scale had been receiving very high wages indeed, some two or three times as high as were received in other establishments, owing to the peculiarly excellent facilities in the Carnegie works, nevertheless the average wages had been regularly increased since the mills had become nonunion. In no year since 1892 had the wages been as low as they were in that year, although since that time the mills had been entirely nonunion. So far as the United States Steel Corporation were concerned their constituent companies dealt directly with the workingmen, and the United States Steel Corporation, as such, had nothing to do with the question. Most of these companies, with the exception of the Carnegie Company, employed union men—in part, at least—and dealt with the unions. He had nothing to say regarding the policy of the United States Steel Corporation further

than to intimate that the matter would be left to the separate companies to deal with as their officers saw fit."

Remedies.

The Commission's discussion of the subject of remedies for the so-called "trust evil" is specially significant. It says:

"Of the later witnesses that have been heard the larger number are of the opinion that comparatively few, if any, legislative remedies are needed. The witnesses whose inclinations are strongly toward free trade are of the opinion that the removal of the tariff on goods controlled by the combinations would be the best, or at any rate the most nearly practicable remedy."

"Hon. Robert W. Tayler says that the Babcock bill, which proposes to remedy the evils of trusts by removing the tariff from trust products, is objectionable because such legislation would destroy the possibility of manufacturing by independent plants the goods now protected under the tariff, and would simply put strength into the large combinations. The passage of the Babcock bill would be to the advantage of the United States Steel Corporation more than to that of any other concern or person. He suggests the same result regarding tin plate."

"Probably more of the witnesses think that something could be gained in the way of greater publicity regarding the business of the combinations, but some of the witnesses speak distinctly against any special degree of publicity. Mr. Schwab, for example, thinks that there ought to be publicity regarding the business of corporations and that though the stockholders are entitled to certain statements, even those should be somewhat limited. Representative Tayler thinks that any legislative interference seems to involve a restraint of trade, to lessen competition, and would therefore be unwise."

W. L. C.

New Haven Iron & Steel Company.—The annual report of the president of the New Haven Iron & Steel Company for the fiscal year ending August 31, 1901, will say in part as follows: The Board of Directors, early in the year, decided to increase the capacity of our plant and to pay for the improvements out of the earnings. In order to do this it was necessary to secure additional machinery, erect suitable building, &c. These improvements are now nearing completion, at a cost of about \$35,000, and from present indications the new plant will be running about October 15, 1901. Our annual output of manufactured iron will be increased by over 10,000 tons, and this fact should result in a material increase in our earnings, as it increases our capacity without increasing our fixed charges. The business is in a very healthy condition; prospects for the winter are good. We have three months' orders on hand at profitable prices, and have placed our orders for the necessary materials to manufacture the same. The following is a summary of the treasurer's report for the fiscal year ending August 31, 1901:

Gross sales.....	\$584,805
Total net profits.....	75,628
Dividends paid during year.....	45,000
Surplus account, August 31, 1901.....	109,003

Assets.....

Plant.....	339,130
Materials.....	77,127
Cash.....	65,123
Organization and charter.....	8,960
Accounts receivable.....	60,835
Bills receivable.....	16,541
Stocks and bonds.....	48,336

Total.....	\$616,054
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Liabilities.....

Capital stock.....	500,000
Accounts payable.....	7,050
Surplus.....	109,003

Total.....	\$616,054
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George W. Darr, president of the Sharon Steel Company, Sharon, Pa., again denies the report that his concern have been sold to the United States Steel Corporation. The impression is pretty general in the trade, however, that some arrangements have been made between the two concerns with regard to selling of output.

The Colorado Fuel & Iron Company.

The pamphlet report of the Colorado Fuel & Iron Company for the fiscal year ending June 30 has just been issued. The president says:

The net earnings from operating departments carried to the credit of income account were \$2,142,671.80, a decrease of \$207,009.82 as compared with the preceding year. The net earnings of the fuel department show a decrease of \$168,462.41, and the iron department a decrease of \$54,757.47. In the fuel department the production of coal increased 153,347 tons, and of coke 11,555 tons. The total net earnings from all sources amounted to \$2,210,522.47, which provided for all fixed charges, sinking funds, &c., leaving a balance of \$1,131,921.90, which was carried to the credit of profit and loss. The balance to the credit of profit and loss account is \$2,096,475.80, representing accrued and undivided profits at the close of the current business year.

The application of net earnings to sinking funds has been on the usual basis as regards assumed depreciation on account of coal and iron ore mined, and an arbitrary amount of \$150,000 has been set aside to provide for the depreciation in value of the steel works plant at Pueblo, and \$30,000 for the Laramie plant. The total amount of net earnings set aside as sinking funds for depreciation of property is \$302,359.04, and an additional amount of \$64,579.46 (being 2 cents per ton on all coal and ore mined) has been set aside as an emergency fund.

The earnings of the fuel department were seriously affected by a strike of coal miners at eight mines, employing 1600 men, which were idle most of the time from January 1 to April 1 (three of the most profitable months of the year). This strike was organized by the United Mine Workers for the purpose of forcing a recognition of their union; no demands were made until after the men had quit work; desperate efforts were made to extend the strike to all of the company's mines, but they totally failed. The strike was declared off unconditionally, and the mines have since been working with a full force, principally of the old employees.

The contracts for the construction of the first of the new blast furnaces called for its completion not later than April 1, 1901, but vexatious and unavoidable delays in the delivery of blowing engines and other requisites have been met with; the furnace is now completed, has been fired up, and will be in full operation by September 1. If no greater delays are met with in the second furnace, it will be blown in by April 1, 1902, and the third furnace by July 1, 1902. The delay in getting the first furnace in operation has not only prevented the company from realizing any earnings during the past year from the large expenditures it has been making, but also made it necessary to purchase a large amount of pig iron from Eastern furnaces at a heavy loss over the cost of production in its own furnaces. The plans for auxiliary plants to utilize, at the maximum of profit, the increased pig iron production were submitted to the stockholders in a circular letter dated June 6, 1901.

The tonnage statements show a production of 3,525,022.70 net tons of coal and 515,436 net tons of coke, the coal needed to produce the latter being evidently included in the former total. The sales of coal amounted to 2,402,618 tons, and there were used at the mines 116,101 tons, at the coke ovens 827,113 tons and in the iron department 175,012 tons. The coke sales figured up 331,773 tons, while 458 tons were used at the ovens and 181,919 in the iron department.

The tonnage statement shows a production of iron and steel of 835,970 net tons, rather a misleading figure since it seems to duplicate the pig iron in the form of steel, and possibly again as finished product. The iron ore output is given at 262,936 tons, and the limestone production at 105,493 tons. All these figures are again gathered together into a somewhat absurd total. It seems that the sales of iron and steel were 201,280 net tons, which more correctly measures the work done by the company.

The following is a comparison of earnings and expenses:

	1901.	1900.	Changes.
Gross earnings.....	\$12,246,546	\$10,350,029	Inc. \$1,896,517
Operating expenses....	10,103,874	8,000,348	Inc. 2,103,526
Net earnings.....	\$2,142,672	\$2,349,681	Dec. \$207,009
Other income.....	67,851	44,995	Inc. 22,856
Total income.....	\$2,210,523	\$2,394,676	Dec. \$184,153
Charges and taxes...	469,395	453,014	Inc. 16,381
Balance.....	\$1,741,128	\$1,941,662	Dec. \$200,536
Sinking fund.....	426,939	384,043	Inc. 42,896
Balance.....	\$1,314,189	\$1,557,619	Dec. \$243,430
Interest and exchange.	22,267	35,125	Dec. 12,858
Applicable to divs.	\$1,291,922	\$1,522,494	Dec. \$230,572
Dividends.....	160,000	590,843	Dec. 430,843
Surplus.....	\$1,131,921	\$931,651	Inc. \$200,270
Previous surplus.....	1,525,345	593,694	Inc. 931,651
Profit and loss sur- plus	\$2,657,266	\$1,525,345	Inc. \$1,131,921

The condensed balance sheet as of June 30 shows:

	Assets.		Liabilities.
Real estate.....	\$16,142,388	\$13,369,069	Inc. \$2,773,318
Fuel department.....	3,771,276	3,081,689	Inc. 689,587
Iron department.....	7,882,908	3,280,655	Inc. 4,602,253
Miscellaneous	119,545	131,834	Dec. 12,289
Hospital department..	46,625	.....	Inc. 46,625
Coal mine development	98,415	91,712	Inc. 6,703
Royalties on leased land	45,159	52,333	Dec. 7,174
Cash and convertible assets	9,260,100	9,127,382	Inc. 132,718
Totals	\$37,366,417	\$29,134,675	Inc. \$8,231,742
Capital stock, pre- ferred	\$2,000,000	\$2,000,000	.....
Capital stock, com- mon	23,000,000	17,000,000	Inc. \$6,000,000
Colorado Fuel general mortgage 6 per cent. bonds	880,000	880,000	.....
Colorado Fuel & Iron consolidated mort- gage bonds less sink- ing fund.....	2,441,000	2,765,000	Dec. 324,000
Colorado Fuel & Iron general mortgage 5 per cent. bonds.....	2,674,000	2,348,000	Inc. 326,000
Tax fund.....	35,000	24,000	Inc. 11,000
Personal injury fund.	30,344	27,203	Inc. 3,141
Fire insurance fund..	37,764	21,277	Ins. 16,487
Relining furnaces' fund.	29,146	15,415	Inc. 13,731
Emergency fund.....	82,125	120,090	Dec. 37,965
Sinking fund.....	1,478,394	1,176,035	Inc. 302,359
Cash liabilities.....	2,582,167	1,232,311	Inc. 1,349,856
Profit and loss surplus	2,096,476	1,525,344	Inc. 571,131
Totals.....	\$37,366,417	\$29,134,675	Inc. \$8,231,742

A detailed statement of the increase and decrease of property accounts shows additions of \$4,602,252.94, including \$737,569.22 for the blast furnaces and \$3,561,832.79 for improvements made under contract No. 1 with the Colorado Finance & Construction Company entered into in October, 1899. In April, 1901, a second contract was made with the company, under which they receive \$6,000,000 of common stock in consideration of \$3,480,000 in cash and the capital stock of the Rocky Mountain Coal & Iron Company.

The Pittsburgh Mfg. Company.—At the annual meeting of the stockholders of the Pittsburgh Mfg. Company, held recently in Pittsburgh, George V. Milliken was elected president to succeed William Johnston, deceased. The concern are builders of Cosgrove patent straightening, bending and punching machines, and are manufacturers of bolts, nuts, rivets and castings.

The Amalgamated Scale.—PITTSBURGH, PA., September 11, 1901.—(By Telegraph.)—The bi-monthly wage settlement at the office of James H. Nutt of Youngstown, labor commissioner for the Republic Iron & Steel Company, showed that the average price of shipments of iron bars in July and August entitles the puddlers to an increase of 25 cents a ton or from \$5.25 to \$5.50 a ton on a 1 4-10 cents card. The finishers will receive an advance of 2 per cent.

Information Wanted.—A correspondent desires to obtain spring steel in quantity, rolled 3 inches wide, $\frac{1}{2}$ inch at one edge and $\frac{1}{8}$ inch at the other edge.

The Newton Milling and Drilling Equipment for Steel Trucks.

Three special tools that have been designed and built by the Newton Machine Tool Works of Philadelphia for finishing the work on the Ajax cast steel truck, built by the Shickle, Harrison & Howard Iron Company, are shown in the accompanying engravings. The outfit is composed of a 14-spindle drill, which is really two seven-

filled up with as many as it will accommodate, and by using two spiral or inserted tooth mills these ends are finished at one time.

The spindles of this machine, which is exceptionally heavy, are 6 inches in diameter, the work table being 6 feet wide. The machine has a variable feed and a quick power movement in either direction. Each head is driven with a $7\frac{1}{2}$ horse-power motor, one of the motors operating the feed and quick return for finishing the center of the truck frame where the bolster is

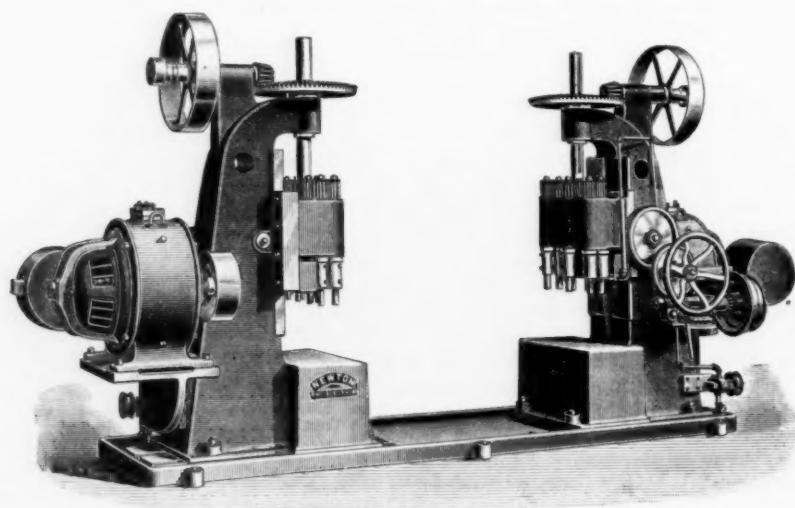


Fig. 1.—Multiple Spindle Drill.

spindle drilling machines, and the two milling machines shown in Figs 2 and 3. One of the drilling machines is fixed to the end of the cast iron bed, the other being adjustable to accommodate the various sizes required for these trucks. Each spindle head carries seven spindles set at a suitable distance to suit their work. Each machine is independently driven with a $7\frac{1}{2}$ horse-power

bolted to the machine, as illustrated by Fig. 3. This is a very heavy machine, with a 6-inch spindle, and the driving and feeding is done by a 10 horse-power motor located on top of the machine. Two of these truck frames are placed endwise on the table, and, as it was necessary to have the head raised high up on the uprights to get over the swell on the end of the frame

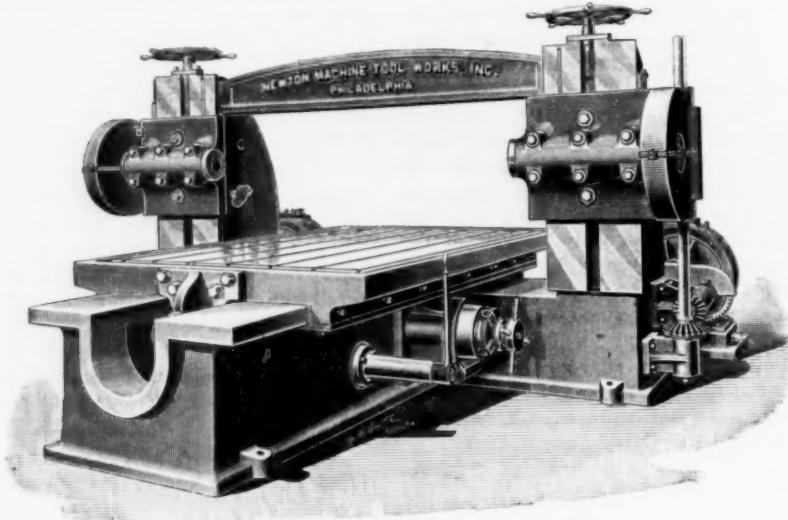


Fig. 2.—Double Spindle Milling Machine.

THE NEWTON MILLING AND DRILLING EQUIPMENT FOR STEEL TRUCKS.

motor. The operation of these machines on the work is that the movable machine is adjusted to give the correct distance between the holes and the cast steel bolster, one end of which rests on each of the work tables, and the seven holes are drilled at each end at one time. When not being used for drilling the bolsters they are used as two separate machines for drilling the sides of the steel truck frame where the bolster is bolted on. When used in this way the steel truck frame is placed in the opposite position to accommodate the holes.

This steel bolster is finished on both ends, where it is riveted to the truck frame, and for this work the double spindle milling machine, illustrated in Fig. 2, was built. The bolsters are laid crosswise on the table, which is

where the boxes are inserted, it was necessary to have a quick movement to raise this head up and lower it down to the work, so an additional motor of 3 horse-power was placed on the side.

There are two pulleys on this motor; one belts to the shaft for quickly adjusting the head and the other belts to the feed mechanism to give a quick movement in either direction to the carriage. Both of these are operated with clutches, the carriage of the machine being fed with friction disks and a rack and spiral pinion. This allows both the carriage and the rail to be quickly adjusted by power, conveniently handling the work.

All of these machines are provided with a pump and facilities for flooding the cutters with lubricant.

Lake Iron Ore Matters.

DULUTH, MINN., September 9, 1901.—Lake ore shipments are just about equal to the same period a year ago, and the daily movement is largely ahead of the corresponding period in 1900. The movement out of Lake Superior alone in August, 1901, was 2,920,000 gross tons; in August, 1900, it was 2,285,000 tons. The big shippers are still busy chartering loose tonnage, getting themselves out of the way for the expected grain movement and clearing the deck, as it were. Just now the most interesting phase of the lake situation is the Duluth wheat chartering. This is going on at the rate of from 500,000 to double as many bushels daily, and there are now probably 15,000,000 bushels chartered for fall delivery. Wheat is coming into Duluth rapidly, at the rate of from 500 to 1000 carloads daily, and is increasing. Most of this vast volume will be sent down the lakes this fall.

Minnesota mines shipped in August 1,950,000 tons, nearly half of it over the Duluth & Iron Range road;

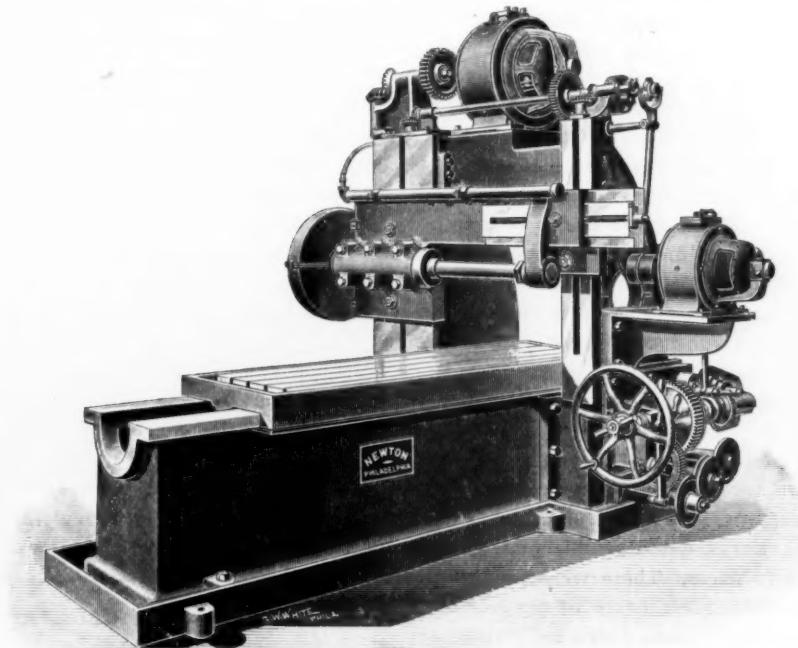
\$500,000 has been spent by various parties in a search for the Ludington ore on this property, but none, nor all together, have carried forward such careful work as is in progress now.

A heavier output than expected will be made at the Regent mines, Negaunee, and the management is looking for more men. The Cambria and Lillie mines of the Republic Iron & Steel Company are not looking well, and the company must transfer more and more of their business to the Mesaba range.

The Chicago & Northwestern road has appointed John D. Campbell of Negaunee general agent for its iron ore traffic in Michigan and Wisconsin, with headquarters at Chicago. The Northwestern handles more iron ore than any road in the world and certainly needs a special superintendent. Mr. Campbell's qualifications are of the highest order.

D. E. W.

The Standard Iron & Steel Company.—The Standard Iron & Steel Company have been organized by Pittsburgh and New Castle capitalists, and propose to build



THE NEWTON MILLING AND DRILLING EQUIPMENT FOR STEEL TRUCKS.

the Gogebic range, 500,000 tons; Marquette, 420,000, and Escanaba 700,000 tons.

As showing what may be done by continuous work, skillful planning, careful management and first-class equipment, the record of the Pioneer mill for August is a stunner. Out of its one shaft 62,530 gross tons were hoisted in the month, 20 hours to a day. The shaft has two skips running in balance. The Pioneer will probably hoist this year 650,000 tons, and when its new steel shaft is completed will be in a position to equal the largest underground mines.

What is called the Breitung Iron Company of Marquette is said by daily papers to have found a rich deposit of specular iron ore some 25 miles north of Sault Ste. Marie and to be installing machinery. It has been known for a long time that some seams of specular ore exist in that region.

I stated last week that the ore from Jones & Laughlin's new Mesaba properties would go out via the East Minnesota Railway. This is not true of the Lincoln, one of their mines, which is under contract to ship via the Duluth, Missabe & Northern.

An exploration shaft at the West Ludington mine, Menominee range, has been sunk 500 feet, and is to go twice as deep if necessary. On the way down exploratory work will be carried along. It is likely to be the most thorough exploration ever given for ore. Over

a mill at New Castle for rolling refined iron bars and iron sheets. The new plant will contain 10 or 15 double puddling furnaces, heating and refining furnaces, a 12-inch mill and two hammers. The sheet mill is to contain six hot mills and two cold mills. The output of the prospective concern is given as from 60 to 75 tons a day.

The Pittsburgh Reduction Company of Pittsburgh, with works at New Kensington, Pa., and Niagara Falls, N. Y., and manufacturers of pure aluminum, have let contracts that will about double the capacity of the Niagara Falls works. The contract for the building has been given to the McClinic-Marshall Construction Company of Pittsburgh, and the material is now being turned out in the works of this concern at Pottstown, Pa.

The French Westinghouse Electric Company have just ordered 12 Baldwin Westinghouse electric locomotives, which are to be used for mining purposes in the French coal regions. The locomotive part will be built by the Baldwin Locomotive Works, Philadelphia, while the electrical equipment is to be made at the Westinghouse works, Pittsburgh.

The Westinghouse Electric & Mfg. Company of Pittsburgh have been awarded a silver prize at the machinery exhibition at Lima, Peru.

The Iron Age

New York, Thursday, September 12, 1901.

DAVID WILLIAMS COMPANY,	PUBLISHERS.
CHARLES KIRCHHOFF,	EDITOR.
GEORGE W. COPE,	ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS,	HARDWARE EDITOR.
JOHN B. KING,	BUSINESS MANAGER.

Iron Syndicates in France.

Although Germany can claim the distinction of possessing the greatest number and variety of iron syndicates France can boast of one which has the distinction of having had sway for the longest time. It is true, however, that the younger French combinations are modeled after the German type.

The veteran French association is the Comptoir Metallurgique de Longwy, which was formed in 1876 primarily to counteract the prejudice which long existed against the Minette pig produced in Eastern France. Then the association consisted only of four works with seven blast furnaces making forge iron and four blast furnaces running in foundry iron, the sales for the first year footing up to 72,000 tons.

Since then the Comptoir de Longwy has become the all powerful factor in the French iron trade, so that a good deal of interest attaches to the details published in regard to it by Georges Villain in a work recently issued, entitled "Le Fer, La Houille et Metallurgie à la Fin du XIX Siècle."

M. Villain quotes some figures to show the preponderating influence upon the iron market of the Comptoir. During the first six months of 1899 there were produced outside of the department of the Meurthe et Moselle, of which Longwy is the commercial center, 502,000 tons of pig iron, practically all of which was consumed in the steel works, puddle mills and foundries owning the blast furnaces. There were produced during the first half of 1899 329,000 tons of pig iron in the Meurthe et Moselle by furnaces which are not controlled by the syndicate because the iron is converted in the plants making the pig. The output of the blast furnaces, whose marketing is handled by the Comptoir, amounted to 456,000 tons. At times a considerable part of this must be exported, but this is done individually by the members, the syndicate handling only the domestic market.

Prices are regulated by a sliding scale, fluctuating with the price of coke, which the furnace men must purchase in the open market. Thus a base price is established, say, at 51.50 francs per metric ton, with coke at a cost f.o.b. furnace at 21 francs. When the price of coke rises 1 franc per ton the price of pig iron is increased by 1.25 francs, and reductions are made in the same manner, to correspond with a decline. The invoices of the coke makers may be inspected by pig iron buyers during the two weeks succeeding the close of the half year. The coke price is determined monthly. During the second half of 1899 it was 25.74 francs, during the first half of 1900, 32.19 francs and during the second half, 33.45 francs, the maximum having been reached in August, 1900, with 33.59 francs, or, say, \$6.67 per gross ton.

In behalf of the Comptoir it is claimed that it presents extreme fluctuations, and the fact is cited in proof thereof that during the boom of 1899-1900 pig iron might have been sold at 100 francs per ton which was delivered to consumers under sliding scale contracts

at 58.50 francs. It is asserted, too, that by regulating home competition the small consumers are protected against the large melters of iron, and that if the syndicate were not in existence a number of foundries and rolling mills would succumb in the struggle with those who operate blast furnaces of their own.

M. Villain, however, has gathered some evidence which indicates that consumers are not all convinced that they are fairly treated. The point is made that it does not really take 1.25 tons of coke to make a ton of pig iron, and that therefore buyers must pay an undue advance to compensate for higher coke prices. It is claimed, too, that the base price of 21 francs per ton of coke is below the average in a term of years, and that, therefore, there is much more danger of additions to price through the operations of the scale than there is of concessions from it to the consumer. In fact, at the time the base price of 21 francs was chosen, coke was selling at 22.725 francs. Besides, it appears that the base price for pig iron, now 51.50 francs, was advanced to that figure in 1897 when it was 46.50 francs. This, it is claimed, led some of the rolling mills to turn to scrap as a raw material. From some of the protests of the foundrymen it seems that for foundry pig the base price has been advanced from 62 to 72 francs, and more recently to 82 francs, with 25 francs as the base price for coke and scale advancing or declining by increments of 1.50 francs for every change of 1 franc in the price of the fuel. Another grievance is that the terms of payment have been changed. The time has been shortened from 120 to 30 days, and the discount has been abolished.

Evidently, full allowance being made for whatever prejudice there may be against syndicates in the mind of M. Villain, the consumers of pig iron are chafing somewhat under the rule of the Longwy pig iron syndicate, which, however, we may note in passing, has made repeated efforts to wriggle under the beneficent rule of the German and Belgian coke syndicates.

Prices and Catastrophes.

One of the most obscure phenomena of the stock market is the decline of prices upon the death, or anticipated death, of the head of the State. War, pestilence and famine are afflictions which interrupt trade and destroy wealth to such an extent that any danger of one of them could not fail to cause a good part of the community to turn its property into money. There are governments so highly centralized and so strictly personal that the death of the monarch or dictator creates uncertainty as to the maintenance of public credit or the development of commercial legislation, which must indispose men to buy for a time and increase the willingness to sell. The Czar of Russia is well known to be averse to war; no one knows anything about his heir; the Czar's death, therefore, might not unnaturally create uncertainty and apprehension and incline men to turn property of variable value into coin, in which shape it could be hoarded or be easily transported to some safer field of investment. President Diaz is equally well known for his determination to maintain order in the republic and to sustain the public credit at all costs, and his power is hardly short of that of a dictator. His death, especially if it were sudden, would inevitably raise some question regarding the stability of the government and the payment of its obligations, and these things would affect prices in Mexico pretty widely until it were known what sort of a man would succeed him.

But in this country there is no reason why the danger of the President's death, or even the actual event, deplorable as it would be, and although it were by violence instead of disease, should make men anxious to sell and reluctant to buy securities. The national credit is long established beyond question, and the integrity of the currency fully secured. Civil order is as certain under one President as another, and is perfectly secure if there were no President at all, in view of the very limited power which the President has over legislation and even over the foreign relations of the country.

But the stock market is influenced by a multitude of forces. No man pretends to know all of them, and it happens that no one knows just who constitute the stock market, for this is made up of all the buyers and all the sellers, and not alone, or chiefly, the members of the exchanges. Therefore there is always an uncertainty about how other people will act. The man who sees no reason why the attempt to kill the President should reduce values still has an idea that it may lead some one else to sell, or may indispose persons to buy what he is carrying on a margin or on borrowed money, and he may sell merely to be sure of selling before the market has been lowered by the selling of others.

An influence of this sort is, of course, ephemeral; it may be severe for a short time; it cannot last long or go far. Happily, the Government does not consist of any one person nor is the business of the country entirely dependent upon the Government.

Skill in Labor.

It is only natural that there are wide differences of opinion as to the time and effort needed to acquire skill in any branch of labor. Generally speaking, exaggerated opinions prevail, one reason being that tradition keeps alive past experience before perfected machinery intervened.

An experiment made by a leading sheet manufacturer is particularly interesting at this time of trouble in the rolling mill. Some time since a likely young man applied for work at a sheet mill. He proved to be a young American, who had found that teaching in a country school held out too little promise for the future. He was willing, too, and did begin as a common laborer. The general manager, however, issued orders that he be advanced from post to post as soon as he had acquired the skill to do justice to the work in hand. He was closely watched, and in 11 months after leaving the ranks of common labor the man was put in charge of a sheet train as roller, which secured to him wages averaging from \$8 to \$10 per day.

This, of course, was a record performance made by an intelligent, ambitious and physically well equipped man. We are told, however, that two years is no unusual period for good men to acquire the skill and experience to fit them for rolling sheets in a modern mill.

Yet the impression does prevail even in very well informed circles that nothing but many years of slow advancement will qualify a man for the responsible work of a sheet roller.

An occurrence like a strike is apt to have other effects besides that of dispelling the idea of rapidly acquiring skill, conspicuous among which is the impetus which it gives to improvement in machinery. Every manufacturer must be aroused to the necessity of making himself more and more independent of skilled and highly paid labor, particularly when it assumes the attitude, collectively, of such a body as the Amalgamated Association. We believe that the plans for developing continuous rolling and for the introduction of such meth-

ods as the Norton process of sheet rolling will be more energetically pushed in the future than they would have been had peace prevailed.

American Stationary Engines in Great Britain.

For months past foreign technical journals have permitted themselves to publish absurd reports of the workmanship upon and the performances of the American engines erected in the Glasgow Electric Power House for tramway service, no disparagement being considered effective that did not finish by contrasting the thoroughness of English engines as compared with the "cheap American" engines. It seems singular that foreign papers should make statements that are so easily refuted, for the two countries are so near now that false reports can be quickly corrected. In the cases above mentioned English and American engines are both employed, and their performance can be accurately compared, both as regards efficiency and continuity of service—the last being of paramount importance in the work done. The facts are directly opposite to the reports published by English trade papers; it is the English engines which have failed to perform according to agreement, not the American, as the following facts attest.

The American engines were delivered in Glasgow two months before the power house was ready to receive them, and exactly on time according to the contract made. In order to have the engines ready to start when the Glasgow Exposition opened it was necessary to push the erection of them night and day, and they were put into service at once without any opportunity to adjust minor details. As a result it was necessary to stop the engines for a short time occasionally to key up or alter the oiling devices, and when this was done it was apparently telegraphed to every paper in the United Kingdom that the American engines had broken down again. As to continuity of service it would seem that "the least said is the soonest mended," for the English engines (supplied by a noted firm) cannot be run more than a few hours at a time, although they have been in use for six months. Meanwhile the American engines are doing the work they were designed to, and have run their 60-day duty trial uninterruptedly, never having been shut down during service hours. Those in Glasgow who are conversant with the facts concede that "the Yankees are on top."

The Youngstown Iron, Sheet & Tube Company.—Some time ago the Board of Directors of the Youngstown Iron, Sheet & Tube Company, at Youngstown, Ohio, decided to increase the capital stock from \$1,000,000 to \$2,000,000. The annual meeting of the stockholders of the company was held in Youngstown on Tuesday and they voted unanimously for the increase. It is probable that the additional capital will be used to build a large open hearth steel plant. Work on the buildings of the Youngstown Iron, Sheet & Tube Company at Hazelton is progressing rapidly, and the concern will be in the market in three or four months as makers of iron sheets and iron tubes. The old Board of Directors was re-elected, and George D. Wick was elected president and treasurer; James A. Campbell, vice-president and general manager; W. H. Foster, secretary, and W. C. Reilly, auditor. W. H. Foster is a new official and was formerly with Myron R. Arms in the sheet business at Niles, Ohio.

At Pittsburgh H. C. Reymer, a creditor of the Star Enameling & Stamping Company of Allegheny, Pa., has petitioned for a receiver for the company. The liabilities of the concern are placed at \$40,000 and the assets at \$80,000. The concern have a capitalization of \$65,000.

PERSONAL.

S. A. Thompson, formerly secretary of the Wheeling Board of Trade, at Wheeling, W. Va., has resigned his position. J. F. Adams is acting as secretary until a permanent one is appointed.

George D. Evans, formerly manager of the Lisbon Works of the American Tin Plate Company, Lisbon, Ohio, has resigned to become manager of the new mill being built by the Carnahan Tin Plate & Sheet Company at Canton, Ohio.

A. A. Straub of Pittsburgh has been appointed real estate agent of the H. C. Frick Coke Company, with headquarters at Scottdale, Pa.

Wm. F. Downs, has resigned as manager of the Federal Graphite Company, Chester Springs, Pa.

Otto Hoffman, for some years connected with the Whitman & Barnes Mfg. Company of West Pullman, Ill., has resigned to accept the position of superintendent of the plant of the James H. Baker Mfg. Company at Pittsburgh.

W. A. Porter, who has been secretary and treasurer of the E. W. Bliss Company of Brooklyn, N. Y., has just been elected vice-president of the company. H. C. Seaman is secretary and L. H. Gould treasurer.

W. J. Olcott, formerly vice-president of the Duluth, Missabe & Northern Railway, controlled by the United States Steel Corporation, has been elected president of the company, with headquarters at Duluth.

Charles H. Morgan of Worcester, Mass., who has been in attendance at the sessions of the International Engineering Congress recently held in Glasgow, is expected to arrive in Boston to-day on the steamship "Saxonia."

Thos. J. Farrell, assistant export sales agent of the American Steel & Wire Company, at New York, has been appointed manager of the London office of that company, succeeding A. Holland, whose term expired on September 1.

William S. Aldrich, who recently located at Toronto, Canada, as a member of the firm of Smith & Aldrich, consulting engineers, has been appointed to the directorship of the Thomas S. Clarkson School of Technology, at Potsdam, N. Y.

George T. Oliver, Henry W. Oliver and W. P. Snyder, all of Pittsburgh, who have been in Europe for several months, sailed for this country on the "Lucania" on Saturday, September 7.

OBITUARY.

JOHN COLVILLE.

John Colville, M.P., after only two days' sickness, died at Cleland House, on August 22, at the age of 49 years, having been born at Glasgow, Scotland, on July 3, 1852. He entered the Motherwell works of the Dallzell Iron & Steel Company, established by his father in 1871. In 1880 the firm went into the manufacture of open hearth steel, and developed one of the largest plants in Scotland, the specialty being steel plates. Mr. Colville entered Parliament in 1895, and devoted the major part of his time to the duties of a public man.

At Pittsburgh, the first and final account of Henry C. Fownes, executor of the estate of James Hemphill, was filed in the courts. Mr. Hemphill was a member of the firm of Mackintosh, Hemphill & Co., founders and engine builders in Pittsburgh. Executor Fownes charges himself with \$1,437,851.43. Among the moneys received are the following: Dividend from the American Tin Plate Company, \$4375; cash received from sale of patents to Mackintosh, Hemphill & Co., \$18,000; cash received from the sale of Carrie Furnace Company stock, \$756,250; cash collected from Mackintosh, Hemphill & Co., \$47,578.38. The executor claims credit for \$22,694.69, leaving a bal-

ance of \$1,415,156.74, consisting in part of the following: One hundred shares National Bank of Western Pennsylvania, \$18,000; 35 shares German National Bank, \$7000; 2500 shares American Tin Plate Company, \$207,500; 300 shares National Steel Company, \$25,500; 2500 shares of Mackintosh, Hemphill & Co., \$250,000; 30 bonds Monongahela Consolidated Coal & Coke Company, \$34,500; real estate on Shady avenue, \$30,000; cash, \$837,566.74.

Trade Publications.

Sheet Iron and Steel.—A very handsomely printed pamphlet containing a series of photo engravings of the different sheet mills has been issued by the American Sheet Steel Company, whose headquarters are at the Battery Park Building, New York. The series includes Vandergrift, Bridgeport, Ohio, McKeesport, Scottdale, Niles, Piqua, Cambridge, Leechburg, Wellsville, Chester, West Virginia, Struthers, New Philadelphia, Scottdale, Canal Dover, Muncie, Canton and others. Facing each page of works photographs is a picture illustrating the different steps in the manufacture of sheets from the steel to the shipping warehouse. A number of tables of weights, net prices of galvanized sheets, &c., are added.

Smooth-On.—The 60-page illustrated catalogue recently published by the Smooth-On Mfg. Company, Jersey City, N. J., is a very interesting and instructive book. It tells all about the different Smooth-On cements, what Smooth-On is, how it is used, gives illustrations for its use, and tells why it is valuable to the engineer, machinist, iron and steel founder, steam fitter and plumber.

Heating Furnaces.—A handsome catalogue by the Rockwell Engineering Company of 26 Cortlandt street, New York, designers and builders of furnaces and heating machines for manufacturing purposes, has been received. These furnaces are designed and constructed for the effective and economic heating of metal and other material and are adapted for the use of any fuel. The catalogue shows annealing and hardening furnaces of different types, annealing furnaces, portable oil rivet heating forges, annealing furnaces with revolving cylinders for using oil, coal, or gas, &c.

The Organization of the Republic Iron & Steel Company.—The following is the new organization of the Republic Iron & Steel Company:

Alexis W. Thompson, president.
John F. Taylor, vice-president.
Archibald W. Houston, vice-president.
W. E. Taylor, vice-president.
W. Barrett Ridgely, vice-president.
John F. Taylor, treasurer.
W. B. Haagsma, secretary.

The Executive Committee consists of G. Watson French, chairman; Alexis W. Thompson, J. F. Taylor, Harry Rubens and W. E. Taylor. The Board of Directors is composed of August Belmont, G. Watson French, W. H. Hassinger, Archibald W. Houston, Peter L. Kimberley, Edwin H. Ohl, W. Nelson Page, W. B. Ridgely, Harry Rubens, Grant B. Schley, George I. Sheldon, J. F. Taylor, Wm. Taylor, A. W. Thompson and Randolph S. Warner.

In his annual report Henry Fink, president of the Norfolk & Western Railroad, states that during the fiscal year ending June 30, 1901, 777,777 tons of bituminous coal were shipped to foreign markets, as compared with 473,075 tons during the previous year.

The transatlantic champion, the "Deutschland," made a new westward record in her trip from Cherbourg to New York recently, making the run of 3045 miles in 5 days 12 hours and 23 minutes, at an average speed of 23 knots per hour. Her largest day's run was 578 miles. The record would have been still better but for some delay on the Newfoundland Banks owing to fog.

A Moderate Decline in Pig Iron Production.

Stocks Show Some Falling Off.

There has been a decline in the current production of pig iron, due principally to the stoppage of four furnaces of the National Steel Company, partly offset by the heavier output from other quarters.

The weekly capacity of the furnaces in blast on September 1 compares as follows with that of the preceding periods:

	Furnaces in blast.	Capacity per week.	Gross tons.
September 1, 1901.	255	299,861	
August 1.	257	303,847	
July 1.	249	310,950	
June 1.	232	314,505	
May 1.	256	90,125	
April 1.	230	206,676	
March 1.	248	292,899	
February 1.	245	278,258	
January 1.	238	250,351	
December 1, 1900.	211	228,846	
November 1.	201	215,304	
October 1.	213	223,169	
September 1.	228	231,778	
August 1.	240	244,426	
July 1.	284	283,413	
June 1.	206	206,376	
May 1.	202	203,850	
April 1.	201	289,482	
March 1.	203	292,643	
February 1.	206	208,014	
January 1.	200	294,188	
December 1, 1899.	283	296,950	
November 1.	277	288,522	
October 1.	265	278,650	
September 1.	257	207,335	
August 1.	244	267,672	
July 1.	237	203,363	
June 1.	220	251,062	
May 1.	217	250,005	
April 1.	205	245,746	
March 1.	102	228,195	
February 1.	105	207,639	
January 1.	200	243,516	

The condition of the charcoal furnaces at the beginning of the month was as follows:

Charcoal Furnaces in Blast September 1, 1901.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New England.	185	55	290	30	290
New York.	90	0	930	9	930
Pennsylvania.	13	12	470	11	470
Maryland.	4	0	443	4	443
Virginia.	3	1	140	2	140
Ohio.	7	3	151	4	169
Kentucky.	3	0	200	3	200
Tennessee.	4	2	423	2	420
Georgia.	4	2	583	2	575
Alabama.	4	3	1,073	1	329
Michigan, Missouri and Wisconsin.	11	7	4,058	4	1,019
Texas.	4	0	872	0	872
Totals.	67	22	6,606	45	5,837

As compared with previous months the record of active charcoal furnaces stands as follows:

	Furnaces in blast.	Capacity per week.
September 1, 1901.	22	6,605
August 1.	22	6,578
July 1.	22	7,157
June 1.	22	7,514
May 1.	22	7,210
April 1.	25	7,910
March 1.	26	8,074
February 1.	31	8,325
January 1.	32	7,097
December 1, 1900.	32	6,779
November 1.	30	7,928
October 1.	31	8,243
September 1.	31	8,227
August 1.	31	8,296
July 1.	32	8,492
June 1.	27	7,605
May 1.	25	6,894
April 1.	29	7,898
March 1.	29	7,047
February 1.	33	8,004
January 1.	30	7,457
December 1, 1899.	30	7,511
November 1.	29	7,113
October 1.	25	6,222
September 1.	24	5,665
August 1.	22	6,189
July 1.	20	6,018
June 1.	16	4,943
May 1.	20	4,846
April 1.	17	4,777

The condition of the coke and anthracite furnaces at the beginning of the month was as follows:

Coke and Anthracite Furnaces in Blast September 1, 1901.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New York.	14	4	4,971	10	4,357
New Jersey.	7	4	3,115	3	1,350
Spiegel.	3	3	528	0	0
Pennsylvania:					
Lehigh Valley.	26	13	7,684	13	5,984
Spiegel.	1	1	126	0	0
Schuylkill Valley.	14	10	7,839	4	1,840
Upper Susquehanna.	2	1	1,029	1	336
Lower Susquehanna.	9	6	5,619	3	931
Spiegel.	1	1	463	0	0
Lebanon Valley.	12	12	8,875	0	0
Pittsburgh District.	31	30	71,193	1	1,225
Spiegel.	1	1	2,471	0	0
Shenango Valley.	15	12	15,091	3	4,333
Western Pennsylvania.	20	13	17,765	7	3,088
Maryland.	5	4	5,795	1	1,200
Wheeling District.	9	6	7,524	3	5,744
Ohio:					
Mahoning Valley.	15	13	26,910	2	2,810
Central and Northern.	14	13	23,334	1	1,400
Hocking Valley.	2	2	835	0	0
Hanging Rock.	12	8	4,483	4	2,014
Illinois.	16	16	32,667	0	0
Spiegel.	1	1	1,071	0	0
Minnesota.	1	0	0	1	763
Wisconsin.	5	3	3,573	2	1,176
Missouri.	1	0	0	1	570
Colorado.	2	1	2,186	1	8,000
Spiegel.	1	1	365	0	0
The South:					
Virginia.	21	17	9,393	4	2,360
Kentucky.	5	3	1,382	2	935
Alabama.	37	34	21,401	18	8,380
Tennessee.	15	10	5,628	5	2,227
Georgia.	1	0	0	1	450
North Carolina.	1	0	0	1	437
Totals.	320	233	293,256	87	56,860

In comparison with previous months the record of the coke and anthracite furnaces stands as follows in gross tons:

	Number in blast.	Capacity per week.
September 1, 1901.	233	293,256
August 1.	235	237,89
July 1.	227	303,793
June 1.	232	306,991
May 1.	233	293,915
April 1.	225	288,766
March 1.	222	284,825
February 1.	214	978,258
January 1.	201	243,254
December 1, 1900.	179	222,067
November 1.	171	207,381
October 1.	182	214,621
September 1.	197	223,551
August 1.	209	236,131
June 1.	252	274,921
May 1.	206	288,771
April 1.	207	286,956
March 1.	203	281,644
February 1.	204	285,596
January 1.	201	290,010
December 1, 1899.	250	286,729
November 1.	253	289,448
October 1.	248	281,409
September 1.	241	272,428
August 1.	233	261,670
July 1.	222	261,483
June 1.	217	257,345
May 1.	204	249,119
April 1.	197	245,249
March 1.	188	240,969
February 1.	175	223,865
Totals.	178	232,673

During August work was resumed by the following stacks: One Thomas at Hokendauqua, Leesport, in the Schuylkill Valley, one Crozer in Virginia and Cumberland in Tennessee. The new Wharton furnace at Port Oram was blown in for the first time. There were blown out two furnaces at New Castle, two at Bellaire, and one at Mingo, one at Columbus, and Etna, in the Hanging Rock region.

Furnace Stocks.

The position of furnace stocks, sold and unsold, as reported to us, was as below on September 1, the same furnaces being represented as in former months. This does not include the holdings of the steel works producing their own iron:

Stocks.	April 1.	May 1.	June 1.	July 1.	Aug. 1.	Sept. 1.
Anthracite and Coke.	398,712	363,351	338,818	327,761	328,787	318,060
Charcoal.	78,163	75,037	73,910	64,837	58,542	59,005
Totals.	476,875	438,288	407,723	392,598	387,329	377,074

The Republic Iron and Steel Company.

In the annual report of the Republic Iron & Steel Company Randolph S. Warner, president, refers to the year's events as follows:

The year covered by this report has been an unusual one for the company in many respects. We did not reach an agreement on the wage scale for our mills for the year commencing July 1, 1900, until late in September. Our mills were idle during July, August and September pending this settlement; and, as a further consequence, the tonnage of finished material produced during the second fiscal period was 254,801 tons less than the production for the previous 14 months' period, and the average selling price very materially less.

To improve the physical condition of our blast furnaces we were obliged to have them all out of blast, during the first six months of the year, for a period of two to five months. The repairs included relining and the installing of the additional boilers, engines and stoves. On account of this our pig iron production for this fiscal period was 175,186 tons less than for the previous 14 months' period. Our blast furnaces are now in first-class condition and our annual output of pig iron will be increased to 500,000 tons or more. The increased tonnage and economy in manufacturing derived from these expenditures are now beginning to show results.

On account of the long idleness at both mills and furnaces, and the reduction in tonnage produced of both finished material and pig iron, during the first six months of this period, it took all of our earnings until April to absorb the fixed charges, repairs and general expenses. The repairs for the year and expenses, while idle, have both been absorbed in operating expenses. In addition to this we had a shrinkage in values of our inventory to contend with, occasioned by the sharp decline in value of both the raw and finished material on hand during the first six months.

Extremely low prices for finished material were ruling in the general market during the first half of the year. While our company pursued a conservative policy in not entering into long time contracts for a large tonnage at the very low prices, we had to meet competition to some extent in order to maintain our position in the trade.

We have largely increased our supply of Bessemer ore during the year by the acquisition of additional mines on the Missabe range, in Minnesota, under a very favorable leasehold, and also by the purchase of a large tonnage of high grade Bessemer ore at a low price, covering a term of years. Many important improvements and renewals have been made during the year. We have largely increased our boiler capacity at several of our plants. All of our blast furnaces are now in first-class condition and should run for two or three years without further extensive repairs. The new billet mill which we are adding to our Bessemer plant at Youngstown, Ohio, is practically completed. This will increase our output of billets to 1000 tons or more per day. The new blast furnace at Thomas, Ala., will also be blown in shortly.

The balance sheet as of June 30, 1901, shows the following:

Real estate, plants, buildings, machinery and other permanent investments.....	\$41,093,724.20
New construction to June 30, 1900.....	\$1,218,203.44
New construction, June 30, 1900, to	
June 30, 1901.....	1,164,175.26
Stock in sundry companies at cost.....	2,382,378.70
New gas pipe lines and prepaid gas leases, prepaid insurance and royalties, above the amount charged to operating.....	147,200.00
Expended on Northern blast furnaces, rebuilding stacks, stoves, &c., being extraordinary improvements in excess of provision for same...	245,171.13
Inventories of raw and finished materials and supplies at market value.....	100,674.86
Accounts and bills receivable.....	3,328,850.13
Cash on hand.....	2,527,209.35
	1,127,107.27
Total.....	\$50,952,315.64

Liabilities.	
Capital stock, preferred.....	\$20,306,900.00
Capital stock, common.....	27,191,000.00
Current accounts and bills payable.....	1,685,350.55
Preference dividend No. 8 (paid July 1, 1901)	355,370.75
Deferred installments on purchase of coal lands, payable in five years, being \$37,000 each year.	185,000.00
Reserve for taxes.....	47,386.18
Reserve for possible losses in collection of outstanding accounts and bills receivable and to cover unknown contingencies, all losses to date having been charged to operating.....	71,642.48
Profit and loss account:	
Net profits since May 1, 1890.....	\$3,952,827.68
Less eight quarterly dividends of 1 1/4 per cent. each on preferred stock.....	2,843,162.00
	1,109,665.68
Total.....	\$50,952,315.64

The profit and loss account for the fiscal year is as follows:

Profit and Loss Account.	
Profits from the business of the company after deducting all expenses, excepting repairs and renewals, and after deducting \$256,196.50 expended in maintenance and repairs of plants while idle during the months of July, August and September, 1900.....	\$1,034,248.31
Less amount expended for improvements, renewals and repairs.....	\$566,622.54
Less amount deducted from ledger values of materials.....	158,527.01
	725,149.55
Net profits during the year.....	\$309,098.76
Surplus on the books on June 30, 1900.....	\$2,222,049.92
Net profits during the year.....	309,098.76
	\$2,531,148.68
Deduct dividends declared during the year, being 7 per cent. on \$20,306,900 preferred stock outstanding.....	1,421,483.00
Surplus on the books on June 30, 1901.....	\$1,109,665.68

MANUFACTURING.

Iron and Steel.

The 12-hour record for rolling billets at the Sharon Works of the National Steel Company, Sharon, Pa., was broken one night last week, when 336 tons were turned out, in spite of the fact that about two hours were lost on account of a break in machinery. The best previous record for a 12-hour turn was 327 tons.

The office building at the tube works of the Reading Iron Company, Reading, Pa., will be torn down and in its place an addition to the new bell mill will be erected. The new addition will be for the purpose of giving additional room for the employees of the new bell mill, which was only recently put in operation. Several new finishing machines will also be installed. The addition will be 59 x 80 feet in size, and will run to South street. The contract has not yet been awarded.

The Carnegie Sheet Iron Company have been granted a charter with a nominal capital of \$1000. The new concern are building a two-mill sheet plant at Carnegie, near Pittsburgh, and are an identified interest of the Carnegie Tube Company, which concern are building a tube mill at Carnegie.

The Hillman Land & Iron Company, Grand Rivers, Ky., composed of John W. Harrison, E. C. Simmons and I. W. Morton, have purchased in Livingston, Lyon and Trigg counties, Kentucky, between 60,000 and 70,000 acres of land. They bought at the same time two furnaces located at Grand Rivers, Ky., which were erected in 1896 by what was then known as the Grand Rivers Company. These furnaces were only run a few weeks and were shut down on account of financial difficulties, having remained idle ever since. Each furnace has a capacity of about 800 tons per week. The majority of the land purchased abounds in iron ore of good quality. It is the intention of the present company to put in blast the two furnaces as soon as possible. The company will also put about 1000 head of cattle on the land, which is excellent for grazing. It is the present intention of the company later on to also operate the small charcoal furnace, as there is a large amount of timber that could be used for that purpose.

The Peru Steel Casting Company, Peru, Ind., celebrated last week the anniversary of their first heat. The first year of the company has been extremely successful. They have built up a large business which has constantly kept the works running to full capacity. This is due, it is stated, to the excellent quality of the steel produced, which is not only extremely tough, but is also soft, so that it machines well, and further is remarkably uniform in its characteristics. The company use the basic open hearth process exclusively and claim to be the

first to be able successfully to use basic steel for the manufacture of all classes of castings for machine and railroad work. The company are enlarging their main buildings for the purpose of securing more room for their finishing department.

The Bridgeport Malleable Iron Company, Bridgeport, Conn., are about to replace some of their old buildings with new ones in connection with their gray iron department in order to afford improved facilities for their work.

Olive Furnace, Lawrence County, Ohio, is to blow in during the current week.

Etna Furnace, at Ironton, Ohio, which was banked for repairs, is expected to go in the current week.

The Juniata Furnace, Newport, Pa., which went out for a new lining, is to blow in about September 20.

The Everett Furnace, at Everett, Bedford County, Pa., is to blow in the current week.

The old Alcalde Furnace, at Rusk, Texas, went out of blast August 21.

It is possible that the Monongahela Works of the American Tin Plate Company, on the South Side, Pittsburgh, which now contain 14 mills, may be reduced to eight when the plant is started up. The Monongahela Works are badly crowded for room and may eventually be removed to some other more favorable location.

The La Grange Land Company of 1002 Ellsworth Building, Chicago, now own the property of the La Grange Furnace Company at Stribling, Stewart County, Tenn. The furnace is to be dismantled and the machinery is for sale.

The annual meeting of the Thomas Iron Company was held yesterday at Hokendauqua, Pa., there being a large attendance. The old Board of Directors was re-elected, these being, in the order of their seniority, Samuel Thomas, W. N. Hulick, B. F. Fackenthal, Jr., J. S. Rodenbough, W. B. Hardenbergh, F. R. Drake and J. S. Krause. The following officers were re-elected: B. F. Fackenthal, Jr., president; W. H. Hulick, vice-president, and J. W. Weaver, secretary and treasurer. A gratifying financial statement was submitted to the stockholders.

General Machinery.

Stephens, Adamson & Co., engineers and machinists, Aurora, Ill., have recently taken contracts for the entire belt conveyor system, including necessary rope drives, belt conveyor appliances, trippers, &c., which will be used in the large new elevator being built by the Grand Trunk Railway at Portland, Maine. They also have the contract for the complete outfit for machinery for Henry L. Goemanz & Son Company's elevator and transfer house at Mansfield, Ohio. They report their general trade excellent. They have contracts for a number of small country elevators, besides several outfits for cottonseed oil mills in the South. They have recently installed a line of pulley molding machines and have added to their original shop equipment several machines for turning and finishing iron pulleys and sheaves.

The Alamo Mfg. Company have purchased the machinery, stock, patterns and factory complete of Olds & Hough, at Albion, Mich., and are consolidating the same with the plant at Hillsdale, Mich. Two new buildings are being erected. Mr. Olds becomes superintendent of the Alamo Mfg. Company.

The Star Drilling Machine Company, Akron, Ohio, manufacturers of portable well drilling machinery, upright steam engines, jars, bits, drilling and fishing tools, have sold to S. Pearson & Son, or the Ferrocarril Nacional del Istmo de Tehuantepec Oficina del Depot. de Materiales, one of their No. 3 drilling machines complete, with tools, &c. It is to be used for water well purposes.

Walterscheid Brothers of Wichita, Kan., machinists and manufacturers of pumps, have started on the erection of a new building, 50 x 62, two stories high, to be used for an office and machine shop. They expect to complete it by October 1.

The McKeesport Real Estate Exchange of McKeesport, Pa., have received a letter from the Ingersoll Rock Drill Company in regard to a site at McKeesport for a new works.

Engines and Boilers.

The Niles Boiler Company of Niles, Ohio, will increase their capital stock from \$50,000 to \$100,000, the additional capital being used to enlarge the plant. R. G. Sykes is president and J. H. Orwig is secretary.

The Phoenix Iron Works Company of Meadville, Pa., have found their business increasing to such an extent as to necessitate the enlargement of their facilities. A contract has been given to the Penn Bridge Company of Beaver Falls, Pa., for the structural work of a new boiler shop, which will more than double their present capacity. The new shop will be equipped with the most approved modern machinery and thoroughly up to date. They are also building an addition to their foundry, which will give a large increase in capacity. The capacity of the engine department is also to be increased.

The Woolley Foundry & Machine Works, Anderson, Ind., have for the past three years given their exclusive attention to the manufacture of the Burger gas engine. This engine is furnished in all sizes from 15 to 200 horse-power. The company have found such a rapidly growing demand for heavy en-

gines that they contemplate the enlargement of their manufacturing facilities for the purpose of turning out engines of still greater power. The capacity of the existing plant is taxed to its utmost to meet the demand for the sizes they are now building. The company are finding a very good engine market in the vicinity of Pittsburgh, the demand running to their largest sized engines to be used for operating electric generators. They have just sold the city of Anderson an engine of 150 horse-power to run a 75-kw. alternating generator for electric lighting. They are further meeting a demand for export, and among other business of this character have just booked an order for two 50 horse-power engines to go to the city of Mexico. The Burger engine has proved itself admirably adapted for electric work. It has an inertia governor and is guaranteed to run within $\frac{1}{2}$ to 1 per cent. from full to no load, or as closely as the steam engine. The engine does this with one cylinder, the plan on which it is built enabling this work to be done without the use of two or more cylinders as in other engines.

The Angola Engine & Foundry Company are building a plant at Angola, Ind., for the manufacture of gas engines as well as conducting a general jobbing business. The plant consists of a foundry and machine shop. The foundry is a brick structure one story high, 40 x 70 feet, and is now about completed. The machine shop will occupy a brick building 48 x 70 feet, three stories high including basement, on which construction is rapidly proceeding. The company expect to begin manufacturing operations about November 1. The gas engine which they will build is of special design in which important improvements have been embodied. The equipment of machinery has been largely ordered. F. D. Morse is president, J. W. McCrory is secretary and manager, O. Carver is treasurer, and B. Wood is superintendent.

Bridges and Buildings.

The McClintic-Marshall Construction Company, Park Building, Pittsburgh, have recently taken contracts for a large amount of structural work. Among these is an order for a number of steel girder bridges for the Pennsylvania Railroad branch lines east of Pittsburgh, requiring 900 tons of material; for a girder bridge on the Oak Lane & Dauphin Street traction lines in Philadelphia, requiring 115 tons of material; for another bridge in the city of Philadelphia, requiring 500 tons of material, and for a Government storehouse in the Norfolk Navy Yard requiring 200 tons of structural material. Other important contracts taken by this company are for three plate girder bridges on the new line of the Pittsburgh & Charleroi Railway Company, an extension of the Monongahela and Pittsburgh and Birmingham traction lines, which will ultimately connect Charleroi with Pittsburgh. In connection with this work three double track steel viaducts, ranging in length from 200 to 400 feet, are to be built. The extensive new plant of the Labelle Steel Company at Steubenville is now being erected by the McClintic-Marshall Construction Company. The works of this company were formerly at Wheeling. The new plant will include skep mills, tube works and open hearth steel works.

Foundries.

The Altoona Foundry & Machine Company, recently organized at Altoona, Pa., have commenced work on their new buildings in that city. They will cover an area of 100 x 170 feet.

S. J. Wright, proprietor of the Peninsula Foundry Company, has purchased a tract of land at Newport News, Va., where ground has been broken for a new foundry, 200 x 75 feet. The old foundry at Newport News will continue work. A specialty is made of bronze, brass and iron castings.

Hardware.

The Scranton Bolt & Nut Company, manufacturers of Diamond Z brand of bolts and nuts and iron products, were organized and their works erected during the summer of 1899, the plant being enlarged during 1900. It has been in full operation ever since. Owing to increasing trade they have just let contracts for buildings and machinery that will double the capacity of their bolt and nut departments. They will also erect a new machine shop and blacksmith shop. The new buildings will be of brick and frame factory construction of latest designs, and will conform generally to their present buildings. The new buildings will give an additional floor space of 17,000 square feet. It is expected that the additional facilities will be in operation on or about January 1, 1902.

The Abingdon Trap Company, Abingdon, Ill., who were organized about two years ago for the manufacture of mouse and rat traps, are meeting with an increasing sale for their Eli trap. They have commenced to appoint resident agents in different parts of the country.

The Midland Iron Works, Racine, Wis., a new corporation, have begun the manufacture of the Wilbourn door hanger. It is the company's intention to manufacture other hardware specialties as soon as they can get their new plant in shape for entering upon such work. The company were organized about two months since, G. N. Prentiss being vice-president and general manager.

Miscellaneous.

The Pennsylvania Railroad has purchased 14 acres of land near the ore docks at Ashtabula, Ohio. The land will probably be used for the building of ore handling machinery.

The Iron and Metal Trades.

Although no official announcement has yet been made as we go to press that the strike has been called off by the Amalgamated Association on the liberal terms given them, the decision of the Advisory Board renders it a question of only a very short time. Practically the basis of the arrangement is that every mill operated by the United States Steel Corporation since the beginning of the strike remains nonunion. This disposes of the wild talk largely indulged in by outsiders that the Corporation must crush the labor union forever, and that no engagements could ever be entered into with it. Excellent counsels have prevailed and we may now expect to have peace for a considerable period.

Our monthly blast furnace statistics show that we entered September with somewhat lessened output, the weekly capacity of the Coke and Anthracite stacks blowing in September 1 having been 293,256 tons, as compared with 297,269 tons on August 1. The strike against the United States Steel Corporation has stopped four blast furnaces in the Wheeling and Shenango districts, with a weekly capacity of 10,000 tons per week as contrasted with 130,000 tons per week as the capacity of its blast furnaces actually running on September 1. This reduction in the output due to the strike has been offset to a considerable extent by the starting of furnace plants in other parts of the country.

While there has been some accumulation of stock in some districts, there has been a decline in others which leaves a net reduction of about 10,000 tons for the month. The stocks reported, of course, refer only to merchant furnaces, and do not include the stock at the Steel plants.

One interesting fact bearing upon the Pig Iron situation is the blowing in of new blast furnaces. Among those which have either started or are about to make their first cast are Port Oram, Warwick, Sharon Steel Company, Iroquois, Colorado, and Republic, at Birmingham. All these, of course, are modern, and will either swell the output or crowd older, weak plants out of the ranks.

There has been more activity in Foundry Pig Iron in the tidewater markets, and a somewhat better feeling prevails. In Bessemer Pig Pittsburgh reports a sale of about 10,000 tons by a large steel works.

So far as the business in Finished Iron and Steel is concerned there are no special features. Consumption continues large, and is urgent, even in some lines not affected by the strike.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

Sept. 11, Sept. 4, Aug. 14, Sept. 12,
1901. 1901. 1901. 1900.

PIG IRON:

	Sept. 11, 1901.	Sept. 4, 1901.	Aug. 14, 1901.	Sept. 12, 1900.
Foundry Pig, No. 2, Standard, Philadelphia	\$14.75	\$14.75	\$14.75	\$15.50
Foundry Pig, No. 2, Southern, Cincinnati	13.00	13.00	13.00	13.75
Foundry Pig, No. 2, Local, Chicago	15.00	15.00	15.00	15.50
Bessemer Pig, Pittsburgh	15.75	15.75	15.75	14.00
Gray Forge, Pittsburgh	15.50	15.50	15.75	18.00
Lake Superior Charcoal, Chicago	17.00	17.00	17.00	18.50

BILLETS, RAILS, ETC.:

Steel Billets, Pittsburgh (nom)....	24.50	24.50	24.00	17.00
Steel Billets, Philadelphia (nom)....	27.00	27.00	26.20	19.50
Steel Billets, Chicago, (nom).....	.....	.....	.....	.....
Wire Rods (delivered)	36.00	36.00	36.00	38.00
Steel Rails, Heavy, Eastern Mill.	28.00	28.00	28.00	30.60
Spikes, Tidewater.	1.80	1.80	1.80	1.50
Splice Bars, Tidewater.	1.50	1.50	1.50	1.50

OLD MATERIAL, PER GROSS TON

O. Steel Rails, Chicago	18.00	18.00	18.00	9.50
O. Steel Rails, Philadelphia	16.50	16.50	16.00	12.75
O. Iron Rails, Chicago	20.50	20.50	20.00	12.50
O. Iron Rails, Philadelphia	18.50	18.50	19.00	14.50
O. Car Wheels, Chicago	16.00	16.50	16.50	15.00
O. Car Wheels, Philadelphia	16.50	16.50	16.50	17.00
Heavy Steel Scrap, Chicago	12.00	12.00	12.00	9.00

FINISHED IRON AND STEEL, PER POUND:

Refined Iron Bars, Philadelphia...	1.62 1/4	1.62 1/4	1.55	1.25
Common Iron Bars, Chicago,	1.60	1.60	1.55	1.35
Common Iron Bars, Youngstown.	1.50	1.50	1.50	1.25
Steel Bars, Tidewater	1.60	1.60	1.60	1.20
Steel Bars, Pittsburgh	1.50	1.50	1.45	1.10
Tank Plates, Tidewater	1.75	1.75	1.75	1.25
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.15
Beams, Tidewater	1.75	1.75	1.75	1.65
Beams, Pittsburgh	1.60	1.60	1.60	1.50
Angles, Tidewater	1.75	1.75	1.75	1.55
Angles, Pittsburgh	1.60	1.60	1.60	1.40
Skelp, Grooved Iron, Pittsburgh..	2.00	2.00	2.05	1.40
Skelp, Sheared Iron, Pittsburgh ..	2.05	2.05	2.10	1.50
Sheets, No. 27, Pittsburgh	3.75	3.75	3.75	2.85
Barb Wire, f.o.b. Pittsburgh	2.00	2.00	2.90	2.80
Wire Nails, f.o.b. Pittsburgh	2.30	2.30	2.30	2.30
Cut Nails, Pittsburgh	2.05	2.05	2.00	1.95

METALS:

Copper, New York	16.50	16.50	16.50	16.75
Spelter, St. Louis	3.87 1/4	3.80	.....	3.90
Lead, New York	4.37 1/4	4.37 1/4	4.37 1/4	4.37 1/4
Lead, St. Louis	4.25	4.27 1/4	4.27 1/4	4.34 1/4
Tin, New York	21.75	25.45	27.00	30.3.16
Antimony, Hallett, New York ..	8.50	8.50	8.50	9.50
Nickel, New York	60.00	60.00	60.00	55.00
Tin Plate, Domestic Bessemer, 100 lbs., New York	nom.	nom.	nom.	4.84

Chicago.

FISHER BUILDING, September 11, 1901.—(By Telegraph.)

The local Iron market continues in quite satisfactory condition. The demand is normal for the season and the volume of business appears to be increasing rather than diminishing. The only direction in which improvement is seriously needed is a better supply of such products as have been made scarce by the strike in the rolling mills. The supply of Tin Plate and Steel Sheets is far below the requirements of consumers and much inconvenience is felt on this account. The starting in the Milwaukee Works of the Illinois Steel Company, which occurred on Monday, gives strong ground for believing that it will not be long until the other mills now closed by strikes will be in operation. Prices are firm all along the line, and as manufacturers are well supplied with orders for months to come no apprehension is entertained of any weakening in values, even if all the now idle mills are soon started.

Pig Iron.—Transactions are steadily growing more numerous. The business of the past week was considerably greater than that of the preceding week, and some commission houses report their trade now approaching something like genuine activity. Inquiries are being received for both Foundry and Malleable Bessemer, calling for much larger quantities than buyers have lately been taking, which shows more confidence in the future. The

molders' strike is gradually losing its importance as the shops increase their force of workmen. The local foundrymen are beginning to purchase Iron to some extent, but the great bulk of buying has so far come from establishments outside of the city. Strong Foundry Iron running low in phosphorus is very scarce and in good demand. The local furnaces are absolutely without stocks and their product is sold far into the future. The new furnace of the Iroquois Iron Company is expected to get into blast about October 1. But it will not relieve the situation, as its product has also been sold ahead. Producers of strong Irons in outside districts also seem to have very little to offer and prices are very firmly held. Southern furnace companies report small stocks on hand and a better demand from other centers of consumption, and intimations are given of a possible early advance of perhaps 50c. a ton. We quote as follows:

Lake Superior Charcoal.....	\$17.00 to \$18.00
Local Coke Foundry, No. 1.....	15.50 to 16.00
Local Coke Foundry, No. 2.....	15.00 to 15.50
Local Coke Foundry, No. 3.....	14.50 to 15.00
Local Scotch, No. 1.....	15.75 to 16.25
Ohio Strong Softeners, No. 1.....	16.00 to 16.50
Southern Slivery, according to Silicon.....	14.90 to 15.15
Southern Coke, No. 1.....	14.65 to 14.90
Southern Coke, No. 2.....	14.15 to 14.40
Southern Coke, No. 3.....	13.65 to 13.90
Southern Coke, No. 1 Soft.....	14.90 to 15.15
Southern Coke, No. 2 Soft.....	14.15 to 14.40
Foundry Forge.....	13.15 to 13.40
Southern Gray Forge.....	12.90 to 13.15
Southern Mottled.....	12.90 to 13.15
Southern Charcoal Softeners, according to Silicon.....	15.00 to 16.50
Tennessee Silicon Pig.....	16.00 to 17.00
Alabama and Georgia Car Wheel.....	19.90 to 20.50
Mailleable Bessemer.....	16.00 to 16.50
Standard Bessemer.....	17.50 to 18.00
Jackson County and Kentucky Slivery, 8 per cent. Silicon.....	15.75 to 16.25

Bars.—The demand is not so heavy as it has been, but this is not a serious matter as mills are so crowded with work that they are unable to make anything like prompt deliveries. The volume of business still coming forward will serve to keep the mills well employed far into the future. The starting up of the Milwaukee Works on Monday will not change the situation, as those works have their product sold for months to come and will not soon be in a position to take new business to any extent. The large consumers who have placed contracts for their season supplies are now beginning to specify heavily on these contracts and this will also fortify the mills against any diminution in fresh orders which may take place. Prices are firm at 1.60c. to 1.70c., Chicago, for mill shipments of Common Iron for the remainder of this year and 1.55c. for more distant deliveries, while Soft Steel Bars are held at 1.65c. to 1.75c. Jobbers are still finding an extremely active demand for shipments from stock and report their assortments incomplete. Stocks of Hoops are being replenished very slowly, if at all. Small lots of Bar Iron are selling at 2c., Steel Bars at 1.90c. to 2c. and Light Hoops at 3c., base.

Car Material.—Good orders have again been placed during the week for all kinds of car material. Sales are reported of Axles, Bars, Shapes and Plates to be used in car construction.

Structural Material.—Contracts have been placed for Shapes by bridge builders and building contractors aggregating several thousand tons. No information is available regarding the particular work for which the material is required, and it is presumed that the contracts have been made to cover running requirements. Such an active demand with no large single undertaking in view indicates a most excellent condition of business in this line. The mills are months behind in making deliveries, and some of the fitting shops connected with large Structural mills are unable to take any more work this year. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c.; 18 inches and over, 1.85c.; Angles, 1.75c. rates; Tees, 1.80c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.15c.

Plates.—Although a good volume of business is reported the demand is less than it has been. Quite a number of projects are in sight which will require a considerable tonnage, so that prospects for the future are en-

couraging. The mills are not pressing for orders, but deliveries are now being promised in four to six weeks. Jobbers report a very good demand from store, which is fully up to the average of recent weeks. Mill shipments are quoted as follows: Tank Plate, $\frac{1}{4}$ -inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c.; Marine, 1.95c. Jobbers are selling small lots from store at 1.90c. to 2c. for Tank and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

Sheets.—Large buyers with heavy unfilled contracts report that they are receiving less than half of the quantity of Sheets due them. This shows how much business is being restricted by the strike in the Sheet Mills. The quantity received from the mills is so small that the consuming trade is constantly kept in a state of aggravation. Jobbers are unable to accumulate their usual assortment of sizes and prices depend on the disposition of the seller or the character of the buyer. Black Sheets may be quoted at 4c. to 4.25c. for No. 27, but it is impossible to secure some sizes at any figure. Galvanized Sheets are quotable at 60 and 5 to 65, but it is also extremely difficult to get some sizes.

Merchant Pipe.—Although the demand is quite heavy, buyers appear to be less urgent than some time since. They are probably influenced by the expectation that the Pipe mills will shortly be in operation and that the supply will then be increased. Stocks are so small that the demand is still in excess of the supply and consequently prices are arbitrary. One of the largest jobbers is finding no difficulty in selling his stock of Black Pipe at 40 off.

Boiler Tubes.—Local stocks are being drawn on by Eastern buyers, who are unable to secure a supply from nearer sources. The stocks in local warehouses have been fairly large so far, but they are now feeling the effects of the demand and some sizes are running short. Prices are difficult to quote, as they depend entirely on the condition of the stocks, character of the buyer, &c.

Cast Pipe.—Although the demand runs almost without exception to small lots, the orders are so numerous that the foundries are more than two months behind in making deliveries. This business keeps up remarkably well, and the year thus far promises to be by far the best ever known in the trade. Prices are firmly held.

Rails and Track Supplies.—The local mills are in receipt of orders for heavy sections of Rails for deliveries running into next year. The tonnage thus taken is not disclosed. Prices are firmly held at \$28 for Heavy Rails and \$29 upward for Light Rails. The Milwaukee Works were started on Monday and the local supply of Light Rails will therefore be again available. Fastenings are in good demand, Spikes being particularly active with advancing prices. Quotations are as follows: Splice Bars, 1.65c. to 1.75c.; Spikes, 2.10c.; Track Bolts, with Hexagon Nuts, 2.90c. to 2.95c.; Square Nuts, 2.75c. to 2.80c.

Billets.—Sales of small lots of Billets are being made mainly for forging purposes. The prices received vary according to the character of the order and the size of the Billet. Carload lots have in this way been sold at prices ranging from \$30 to \$35. An inquiry is now in the market for 3000 tons of 4 x 4 inch Bessemer Billets. A new Rod mill in Indiana will need 100 tons of Billets daily after January 1, and quotations are now being asked.

Merchant Steel.—The leading manufacturers of Merchant Steel report their mills crowded with orders. They are notifying the trade that it will be impossible for them to promise deliveries on standard material under three or four months. The market is consequently exceedingly firm with a possibility of higher prices rather than any concession. Mill shipments, Chicago, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 to 60 off. Ordinary grades of Crucible Tool Steel are quoted at 6 $\frac{1}{2}$ c. for carloads and 7c. to 7 $\frac{1}{2}$ c. from store; Specials, 12c. upward.

The Iron and Metal Trades.

Although no official announcement has yet been made as we go to press that the strike has been called off by the Amalgamated Association on the liberal terms given them, the decision of the Advisory Board renders it a question of only a very short time. Practically the basis of the arrangement is that every mill operated by the United States Steel Corporation since the beginning of the strike remains nonunion. This disposes of the wild talk largely indulged in by outsiders that the Corporation must crush the labor union forever, and that no engagements could ever be entered into with it. Excellent counsels have prevailed and we may now expect to have peace for a considerable period.

Our monthly blast furnace statistics show that we entered September with somewhat lessened output, the weekly capacity of the Coke and Anthracite stacks blowing in September 1 having been 293,256 tons, as compared with 297,269 tons on August 1. The strike against the United States Steel Corporation has stopped four blast furnaces in the Wheeling and Shenango districts, with a weekly capacity of 10,000 tons per week as contrasted with 130,000 tons per week as the capacity of its blast furnaces actually running on September 1. This reduction in the output due to the strike has been offset to a considerable extent by the starting of furnace plants in other parts of the country.

While there has been some accumulation of stock in some districts, there has been a decline in others which leaves a net reduction of about 10,000 tons for the month. The stocks reported, of course, refer only to merchant furnaces, and do not include the stock at the Steel plants.

One interesting fact bearing upon the Pig Iron situation is the blowing in of new blast furnaces. Among those which have either started or are about to make their first cast are Port Oram, Warwick, Sharon Steel Company, Iroquois, Colorado, and Republic, at Birmingham. All these, of course, are modern, and will either swell the output or crowd older, weak plants out of the ranks.

There has been more activity in Foundry Pig Iron in the tidewater markets, and a somewhat better feeling prevails. In Bessemer Pig Pittsburgh reports a sale of about 10,000 tons by a large steel works.

So far as the business in Finished Iron and Steel is concerned there are no special features. Consumption continues large, and is urgent, even in some lines not affected by the strike.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

Sept. 11, Sept. 4, Aug. 14, Sept. 12.
1901. 1901. 1901. 1900.

PIG IRON:

Foundry Pig, No. 2, Standard, Philadelphia	\$14.75	\$14.75	\$14.75	\$15.50
Foundry Pig, No. 2, Southern, Cincinnati.....	18.00	18.00	18.00	18.75
Foundry Pig, No. 2, Local, Chicago	15.00	15.00	15.00	15.50
Bessemer Pig, Pittsburgh.....	15.75	15.75	15.75	14.00
Gray Forge, Pittsburgh.....	18.50	18.50	18.75	18.00
Lake Superior Charcoal, Chicago ..	17.00	17.00	17.00	18.50

BILLETS, RAILS, ETC.:

Steel Billets, Pittsburgh (nom)....	24.50	24.50	24.00	17.00
Steel Billets, Philadelphia (nom)....	27.00	27.00	26.20	19.50
Steel Billets, Chicago, (nom).....	.....	.....	.....	.....
Wire Rods (delivered).....	36.00	36.00	36.00	38.00
Steel Rails, Heavy, Eastern Mill..	28.00	28.00	28.00	30.00
Spikes, Tidewater.....	1.80	1.80	1.80	1.50
Splice Bars, Tidewater.....	1.50	1.50	1.50	1.50

OLD MATERIAL, PER GROSS TON

O. Steel Rails, Chicago.....	13.00	13.00	13.00	9.50
O. Steel Rails, Philadelphia.....	16.50	16.50	16.00	12.75
O. Iron Rails, Chicago	20.50	20.50	20.00	12.50
O. Iron Rails, Philadelphia.....	18.50	18.50	19.00	14.50
O. Car Wheels, Chicago	<i>16.00</i>	16.50	16.50	15.00
O. Car Wheels, Philadelphia.....	16.50	16.50	16.50	17.00
Heavy Steel Scrap, Chicago	12.00	12.00	12.00	9.00

FINISHED IRON AND STEEL, PER POUND:

Refined Iron Bars, Philadelphia...	1.62 1/2	1.62 1/2	1.55	1.25
Common Iron Bars, Chicago.	1.60	1.60	1.55	1.35
Common Iron Bars, Youngstown.	1.50	1.50	1.50	1.25
Steel Bars, Tidewater.....	1.60	1.6 2/4	1.60	1.20
Steel Bars, Pittsburgh	1.50	1.50	1.45	1.10
Tank Plates, Tidewater.....	1.75	1.75	1.75	1.25
Tank Plates, Pittsburgh.....	1.60	1.60	1.60	1.15
Beams, Tidewater.....	1.75	1.75	1.75	1.65
Beams, Pittsburgh	1.60	1.60	1.60	1.50
Angles, Tidewater	1.75	1.75	1.75	1.55
Angles, Pittsburgh.....	1.60	1.60	1.60	1.40
Skelp, Grooved Iron, Pittsburgh..	2.00	2.00	2.05	1.40
Skelp, Sheared Iron, Pittsburgh ..	2.05	2.05	2.10	1.50
Sheets, No. 27, Pittsburgh.....	2.75	2.75	2.75	2.85
Barb Wire, f.o.b. Pittsburgh.....	2.90	2.90	2.90	2.80
Wire Nails, f.o.b. Pittsburgh.....	2.90	2.90	2.90	2.90
Cut Nails, Pittsburgh.....	2.05	2.05	2.00	1.95

METALS:

Copper, New York.....	16.50	16.50	16.50	16.75
Spelter, St. Louis	3.87 1/2	3.80	.....	3.90
Lead, New York.....	4.37 1/2	4.37 1/2	4.37 1/2	4.37 1/2
Lead, St. Louis	4.25	4.27 1/2	4.25	4.34 1/2
Tin, New York	24.75	25.45	27.00	30.3 1/2
Antimony, Hallett, New York ..	8.50	8.50	8.50	9.50
Nickel, New York.....	60.00	60.00	60.00	55.00
Tin Plate, Domestic Bessemer, 100 lbs., New York.....	nom.	nom.	nom.	4.84

Chicago.

FISHER BUILDING, September 11, 1901.—(By Telegraph.)

The local Iron market continues in quite satisfactory condition. The demand is normal for the season and the volume of business appears to be increasing rather than diminishing. The only direction in which improvement is seriously needed is a better supply of such products as have been made scarce by the strike in the rolling mills. The supply of Tin Plate and Steel Sheets is far below the requirements of consumers and much inconvenience is felt on this account. The starting in the Milwaukee Works of the Illinois Steel Company, which occurred on Monday, gives strong ground for believing that it will not be long until the other mills now closed by strikes will be in operation. Prices are firm all along the line, and as manufacturers are well supplied with orders for months to come no apprehension is entertained of any weakening in values, even if all the now idle mills are soon started.

Pig Iron.—Transactions are steadily growing more numerous. The business of the past week was considerably greater than that of the preceding week, and some commission houses report their trade now approaching something like genuine activity. Inquiries are being received for both Foundry and Malleable Bessemer, calling for much larger quantities than buyers have lately been taking, which shows more confidence in the future. The

holders' strike is gradually losing its importance as the shops increase their force of workmen. The local foundrymen are beginning to purchase Iron to some extent, but the great bulk of buying has so far come from establishments outside of the city. Strong Foundry Iron running low in phosphorus is very scarce and in good demand. The local furnaces are absolutely without stocks and their product is sold far into the future. The new furnace of the Iroquois Iron Company is expected to get into blast about October 1. But it will not relieve the situation, as its product has also been sold ahead. Producers of strong Irons in outside districts also seem to have very little to offer and prices are very firmly held. Southern furnace companies report small stocks on hand and a better demand from other centers of consumption, and intimations are given of a possible early advance of perhaps 50c. a ton. We quote as follows:

Lake Superior Charcoal	\$17.00 to \$18.00
Local Coke Foundry, No. 1	15.50 to 16.00
Local Coke Foundry, No. 2	15.00 to 15.50
Local Coke Foundry, No. 3	14.50 to 15.00
Local Scotch, No. 1	15.75 to 16.25
Ohio Strong Softeners, No. 1	16.00 to 16.50
Southern Silvery, according to Silicon	14.90 to 15.15
Southern Coke, No. 1	14.65 to 14.90
Southern Coke, No. 2	14.15 to 14.40
Southern Coke, No. 3	13.65 to 13.90
Southern Coke, No. 1 Soft	14.90 to 15.15
Southern Coke, No. 2 Soft	14.15 to 14.40
Foundry Forge	13.15 to 13.40
Southern Gray Forge	12.90 to 13.15
Southern Mottled	12.90 to 13.15
Southern Charcoal Softeners, according to Silicon	15.00 to 16.50
Tennessee Silicon Pig	16.00 to 17.00
Alabama and Georgia Car Wheel	19.90 to 20.50
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.50 to 18.00
Jackson County and Kentucky Silvery, 8 per cent. Silicon	15.75 to 16.25

Bars.—The demand is not so heavy as it has been, but this is not a serious matter as mills are so crowded with work that they are unable to make anything like prompt deliveries. The volume of business still coming forward will serve to keep the mills well employed far into the future. The starting up of the Milwaukee Works on Monday will not change the situation, as those works have their product sold for months to come and will not soon be in a position to take new business to any extent. The large consumers who have placed contracts for their season supplies are now beginning to specify heavily on these contracts and this will also fortify the mills against any diminution in fresh orders which may take place. Prices are firm at 1.60c. to 1.70c., Chicago, for mill shipments of Common Iron for the remainder of this year and 1.55c. for more distant deliveries, while Soft Steel Bars are held at 1.65c. to 1.75c. Jobbers are still finding an extremely active demand for shipments from stock and report their assortments incomplete. Stocks of Hoops are being replenished very slowly, if at all. Small lots of Bar Iron are selling at 2c., Steel Bars at 1.90c. to 2c. and Light Hoops at 3c., base.

Car Material.—Good orders have again been placed during the week for all kinds of car material. Sales are reported of Axles, Bars, Shapes and Plates to be used in car construction.

Structural Material.—Contracts have been placed for Shapes by bridge builders and building contractors aggregating several thousand tons. No information is available regarding the particular work for which the material is required, and it is presumed that the contracts have been made to cover running requirements. Such an active demand with no large single undertaking in view indicates a most excellent condition of business in this line. The mills are months behind in making deliveries, and some of the fitting shops connected with large Structural mills are unable to take any more work this year. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c.; 18 inches and over, 1.85c.; Angles, 1.75c. rates; Tees, 1.80c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.15c.

Plates.—Although a good volume of business is reported the demand is less than it has been. Quite a number of projects are in sight which will require a considerable tonnage, so that prospects for the future are en-

couraging. The mills are not pressing for orders, but deliveries are now being promised in four to six weeks. Jobbers report a very good demand from store, which is fully up to the average of recent weeks. Mill shipments are quoted as follows: Tank Plate, $\frac{1}{4}$ -inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c.; Marine, 1.95c. Jobbers are selling small lots from store at 1.90c. to 2c. for Tank and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

Sheets.—Large buyers with heavy unfilled contracts report that they are receiving less than half of the quantity of Sheets due them. This shows how much business is being restricted by the strike in the Sheet Mills. The quantity received from the mills is so small that the consuming trade is constantly kept in a state of aggravation. Jobbers are unable to accumulate their usual assortment of sizes and prices depend on the disposition of the seller or the character of the buyer. Black Sheets may be quoted at 4c. to 4.25c. for No. 27, but it is impossible to secure some sizes at any figure. Galvanized Sheets are quotable at 60 and 5 to 65, but it is also extremely difficult to get some sizes.

Merchant Pipe.—Although the demand is quite heavy, buyers appear to be less urgent than some time since. They are probably influenced by the expectation that the Pipe mills will shortly be in operation and that the supply will then be increased. Stocks are so small that the demand is still in excess of the supply and consequently prices are arbitrary. One of the largest jobbers is finding no difficulty in selling his stock of Black Pipe at 40 off.

Boiler Tubes.—Local stocks are being drawn on by Eastern buyers, who are unable to secure a supply from nearer sources. The stocks in local warehouses have been fairly large so far, but they are now feeling the effects of the demand and some sizes are running short. Prices are difficult to quote, as they depend entirely on the condition of the stocks, character of the buyer, &c.

Cast Pipe.—Although the demand runs almost without exception to small lots, the orders are so numerous that the foundries are more than two months behind in making deliveries. This business keeps up remarkably well, and the year thus far promises to be by far the best ever known in the trade. Prices are firmly held.

Rails and Track Supplies.—The local mills are in receipt of orders for heavy sections of Rails for deliveries running into next year. The tonnage thus taken is not disclosed. Prices are firmly held at \$28 for Heavy Rails and \$29 upward for Light Rails. The Milwaukee Works were started on Monday and the local supply of Light Rails will therefore be again available. Fastenings are in good demand, Spikes being particularly active with advancing prices. Quotations are as follows: Splice Bars, 1.65c. to 1.75c.; Spikes, 2.10c.; Track Bolts, with Hexagon Nuts, 2.90c. to 2.95c.; Square Nuts, 2.75c. to 2.80c.

Billets.—Sales of small lots of Billets are being made mainly for forging purposes. The prices received vary according to the character of the order and the size of the Billet. Carload lots have in this way been sold at prices ranging from \$30 to \$35. An inquiry is now in the market for 3000 tons of 4 x 4 inch Bessemer Billets. A new Rod mill in Indiana will need 100 tons of Billets daily after January 1, and quotations are now being asked.

Merchant Steel.—The leading manufacturers of Merchant Steel report their mills crowded with orders. They are notifying the trade that it will be impossible for them to promise deliveries on standard material under three or four months. The market is consequently exceedingly firm with a possibility of higher prices rather than any concession. Mill shipments, Chicago, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 to 60 off. Ordinary grades of Crucible Tool Steel are quoted at 63c. for carloads and 7c. to 7 $\frac{1}{2}$ c. from store; Specials, 12c. upward.

Old Material.—The heavy purchases of Railroad Wrought Scrap are continued by dealers and the market has become decidedly stronger. The consumers have fought the upward tendency of prices, but the influences at work have been too strong for them and somewhat higher values are quite generally prevailing. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$20.50 to \$21.00
Old Steel Rails, mixed lengths.....	13.00 to 13.50
Old Steel Rails, long lengths.....	15.50 to 16.00
Heavy Relaying Rails.....	25.50 to 26.00
Old Car Wheels.....	16.00 to 16.50
Heavy Melting Steel Scrap.....	12.00 to 12.50
Mixed Steel.....	10.50 to 11.00

The following quotations are per net ton:

Iron Fish Plates.....	\$16.50 to \$17.00
Iron Car Axles.....	20.00 to 20.50
Steel Car Axles.....	15.50 to 16.00
No. 1 Railroad Wrought.....	16.00 to 16.50
No. 2 Railroad Wrought.....	14.50 to 15.00
Shafting.....	16.00 to 16.50
No. 1 Dealers' Forge.....	13.00 to 13.50
No. 1 Busheling and Wrought Pipe.....	12.00 to 12.50
Iron Axle Turnings.....	11.00 to 11.50
Soft Steel Axle Turnings.....	9.50 to 10.00
Machine Shop Turnings.....	10.00 to 10.50
Cast Borings.....	5.00 to 5.25
Mixed Borings, &c.....	5.25 to 5.50
No. 1 Boilers, cut.....	11.50 to 12.00
No. 2 Boilers, cut.....	9.50 to 10.00
Heavy Cast Scrap.....	11.00 to 11.50
Stove Plate and Light Cast Scrap.....	8.50 to 9.00
Railroad Malleable.....	12.00 to 12.50
Agricultural Malleable.....	11.00 to 11.50

Metals.—The demand is only moderate, as the steadiness with which prices are held checks any disposition to purchase in quantity. Carload lots of Lake Copper are maintained at 17c. and Casting brands at 16½c. Pig Lead is unchanged at 4.32½c for Desilverized and 4.42½c. for Corroding in 50-ton lots. Dealers continue to quote selling prices on small lots of Old Metals as follows: Copper Wire and Heavy, 15c. to 15¼c.; Copper Bottoms, 14c.; Pipe Lead, 4.15c.; Zinc, 2.75c.

Coke.—Business is very active. The car supply has been so short that deliveries are seriously interfered with, which leads to the placing of many duplicate orders. Connellsville 72-hour Foundry Coke is quoted at \$4.50 to \$5.

Philadelphia.

FORREST BUILDING, September 10, 1901.

The sad event of the past week has to some extent diverted attention from trade matters, but apart from that the general situation has been very satisfactory. It might be a little too strong to say that things are better, but they are certainly no worse, and in some lines indications of improvement appear to be developing. Whether the chief incident of the past week will have any permanently adverse influence on business remains to be seen, but it certainly ought to result in more strenuous methods of guarding those holding high positions. Apart from the physical strain which is involved by promiscuous handshaking, we have an example of the danger to life which is involved by such free and easy methods; but, apart from the personal loss, the public welfare demands greater security for our Chief Executive and his associates. The impression in trade circles appears to be that while this unfortunate and despicable incident may suggest new dangers in the already somewhat impaired outlook, it will not be of a permanently adverse character, especially as the reports from Buffalo are regarded as being unexpectedly favorable. If these continue a day or two longer the effect from a business point of view will be pretty well dissipated. Assuming this to be the case, we may expect an active market, without material change in prices. Pig Iron and Steel both present a stronger front than for some time past, but in the more advanced lines the feeling is slightly easier—that is to say, there is less difficulty in placing orders and better deliveries can be had without having to pay extra for the accommodation. In such times as these it is impossible to say what the exact course of the market will be in the near future, as that depends to a greater extent than usual upon conditions which are as yet entirely undeveloped.

Pig Iron.—During the past week an active demand for Pig Iron was in evidence, and some very satisfactory sales were made, particularly in Mill Irons. Lots of from 500 to 3000 tons each were taken, and Standard

brands brought the full figure of \$14 for Philadelphia and Schuylkill Valley deliveries. Southern brands for the Harrisburg and Baltimore districts were also well taken at about 50c. less, with similar concessions on Foundry grades—the difference in price being due mostly to the more favorable location for deliveries from furnaces in the South. Some Basic Iron was also taken for Pittsburgh delivery at prices very much beyond a parity of the Eastern markets. The general tendency, therefore, has been toward a larger business, and in many cases at better prices, but not enough so to warrant any general revision of quotations. It is clear, however, that a great deal of Iron is likely to be wanted, and again the monthly reports from furnaces will be scanned with very deep interest. The scarcity of Iron at most of the Eastern furnaces precludes the expectation of increased stocks, but how far that will be offset in other districts is what the trade are anxious to find out. Prices for city and nearby deliveries are about as follows, and from 25c. to 50c. less at points within a radius of 100 miles South or West: No. 1 X Foundry, \$15.50 to \$16; No. 2 X Foundry, \$14.75 to \$15.25; No. 2 Plain, \$14.25 to \$14.75; Standard Gray Forge, \$13.75 to \$14; Ordinary Gray Forge, \$13.25 to \$13.50; Basic (Chilled), \$14 to \$14.25; Bessemer, nominal, at about \$14.50.

Billets.—The market is so bare of Steel that prices are hardly quotable. The difficulty is to get some one to offer Steel, and when that is done there is no trouble in getting anywhere between \$27.25 to \$28, according to deliveries. There is no doubt that mills are heavily sold ahead, so that the shortage looks like continuing until well into the winter months.

Plates.—There is no special change to note, the demand being full up to what can be handled. Orders are of a diversified character, and represent good buying in all departments, showing that the consuming interests are in first-class condition. Prices are steady and unchanged as last quoted—viz., for city and nearby deliveries: Plates, ¼-inch and thicker, 1.75c. to 1.80c.; Universals, 1.75c. to 1.80c.; Flange, 1.90c. to 2.10c.

Structural Material.—It is difficult to meet the demands that are made for early deliveries, although the mills are running to their fullest capacity in most of their departments. Prospects are exceedingly good for fall and winter work at firm and unchanged prices as follows, for seaboard or nearby deliveries: Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.

Bars.—There is plenty of business around, and mills have no difficulty in keeping their order books well covered. Prices are firm, and as some of the mills are running on Skelp, Bars are not as easy to get as they were a little while ago. Sales of light grooved Skelp have been made at 1.95c., f.o.b. cars, sellers' mills, Iron Bars at 1.60c. and Steel Bars at about the same figure for carload lots and upward.

Sheets.—There is no abatement in the scarcity of Sheets, so that prices are more or less nominal. The difficulty is to find a seller; when that is done prices are almost anything that is asked, providing deliveries can be had within a reasonable time. Nominal quotations would be about as follows for best Sheets (Common Sheets two-tenths less): No. 10, 2.60c.; No. 14, 2.80c.; No. 16, 2.90c. to 3c.; Nos. 18-20, 3.50c.; Nos. 21-24, 3.60c.; Nos. 26, 27, 3.75c. to 3.80c.; No. 28, 4c. to 4.25c.

Old Material.—The market is a little unsettled, but there is no distinct change in prices. Holders are firm, and in most cases manage to get about the same prices as for some weeks past. Bids and offers for deliveries in buyers' yards would be about as follows: Choice Railroad Scrap, \$17.75 to \$18.50; Country Scrap, \$15.50 to \$16; No. 2 Light (Ordinary), \$12 to \$12.50; No. 2 Light (Forge), \$13.75 to \$14.25; Machinery Cast, \$13.75 to \$14.25; Heavy Steel, \$16.25 to \$16.50; Old Steel Rails, \$16.50 to \$16.75; Old Iron Rails, \$18.50 to \$19.50; Wrought Turnings, \$11.50 to \$12; Cast Borings, \$7.25 to \$7.50; Old Car Wheels, \$16.50 to \$17; Iron Axles, \$22 to \$23; Steel Axles, \$17 to \$18.

John J. Caine, Jr., and Geo. L. Plitt have opened an office in the Real Estate Trust Building, in Philadelphia.

phia, under the firm name of Caine & Plitt, as dealers in Iron and Steel by-products. Mr. Caine was for some years with the Maryland Steel Company, at Sparrows Point, and more recently as purchasing agent for the Tidewater Steel Company, at Chester.

L. & R. Wister & Co. of Philadelphia, for the purpose of offering better facilities to their Western trade, have opened an office at 331 Fourth avenue, Pittsburgh, under the management of Stewart B. Marshall, who for several years held a responsible position with the Dunbar Iron Company.

Cleveland.

CLEVELAND, OHIO, September 10, 1901.

Iron Ore.—The report of the Ore movement during the month of August shows that there were received at the various Ohio ports 3,602,005 tons. This amount added to the shipment down the lake during the previous months of the open season makes a total of 12,263,438 to September 1. The season to date is 102,586 tons behind the movement to September 1 a year ago. When it is considered that this year the season of navigation opened six weeks later than it ordinarily does, because of some abnormal conditions of weather and labor, it is seen that the speed of shipment has never been equaled. While the big rush of material down the lakes has freed the shippers from some of the entanglements of a late fall movement it has not lifted the responsibility of moving the wild Ore entirely, as some of them hoped. In consequence both contract and wild vessels are now being utilized to a very good purpose, and the lower lake docks are still considerably congested. While the chartering is free and the demand for boats is brisk the rates have not changed nor do they show any tendency to advance. The other shippers are bidding boats away from the Ore shippers, but it may be the middle of October before any Ore men will have to advance rates to obtain tonnage. The rates therefore hold at 80c. from Duluth, 70c. from Marquette and 60c. from Escanaba.

Pig Iron.—The members of the Bessemer Association are considering seriously what is to be done with the Iron which is now being put out by their stacks and for which there is no market. They have refused to take definite action before this time in the belief that the strike of the Amalgamated Association is soon to be over. Enough inquiries have been made and the demand for Finished Material has been so steady and promising to assure the Bessemer producers that when the strike is over there will be a demand for their material. Some of the furnaces have been collecting stocks, while the Sheet and Bar mills have been closed, out of their surplus of production. It is seriously contemplated, if the strike continues, to blow out some of the furnaces which are now employed. The belief is that the surplus is sufficient now for ordinary emergencies. The demand for Basic is increasing some. A number of small lots have been sold this week in this territory at \$15. While the lots have not been large individually, they have aggregated a satisfactory tonnage. Most all sales are for immediate delivery. The demand for Foundry grades still keeps up. The prices have not changed in the least, quotations holding at \$13.50 to \$13.75 on No. 2 and \$14 to \$14.25 on No. 1 at the furnace.

Finished Material.—In the face of the drought and in the face of the labor troubles and other things that would tend to discourage the buyers of Finished Material, the market has shown a steady and large business all through the week, maintaining the pace which has been noted from time to time during the summer. This condition prevails in all branches of the trade, but has especial reference to Structural Material and Rails. Rails have in reality been the feature of the market this week. The opening sale was of 5000 tons for an electric line operating in the Western part of Ohio. Following this a number of steam lines came in and covered for more of their needs beyond the first of the year. The market heard this week of a prospective meeting of the Plate Pool, to consider a change in prices. As far as learned, however, no change is contemplated or will be

made. The demand for Plates keeps up, especially from the boiler concerns and locomotive works, with now and then an order for Ship Plate being added to the list. The past sales and the new business showing up have about consumed the capacity of some of the Plate concerns, and deliveries are not promised as promptly as has been the case in the last few weeks. Deliveries on Beams and Channels are harder to obtain now than late reports indicated, because the new orders coming in have added to the congestion. It is virtually impossible now to get deliveries much before November 1. Small Angles especially are very scarce and deliveries are difficult. The producing capacity of Sheets has been sold up entirely for some time ahead and producers are making no promises on deliveries. Those who have need for material in any short time are forced to rely entirely upon the stocks, which are getting low. The prices out of stock do not change from 3.95c. on No. 28, one pass, cold rolled, and 2.50c. on No. 10 Blue Annealed out of stock. Bars are no easier than Sheets and deliveries are practically impossible. The prices do not change.

Old Iron.—Scrap is being sold in large lots occasionally with few new conditions in the market and with prices steady. Quotations are: No. 1 Wrought, \$15 net; Heavy Steel, \$15 gross; Steel Rails, \$15 gross; Cast Ironings, \$6 net; Wrought Turnings, \$10 net.

Cohen, Nagusky & Co., Cleveland, dealers in Iron and Steel Scrap, have located their new yard and office on Willson avenue and Pennsylvania Railroad. The yard is being equipped with three shears, railroad scales, drop, crane, sheds and everything necessary to make it one of the best equipped Scrap Iron yards in the country. Their largest shear will have a 32-inch blade, and will cut the heaviest section of Iron or Steel Rails and up to 5-inch round Iron cold; weight about 5200 lbs. The Lloyd Booth Company of Youngstown are building the shears. Max Cohen and Jos. Nagusky have been connected with the Scrap Iron business for many years.

St. Louis.

CHEMICAL BUILDING, September 11, 1901.—(*By Telegraph.*)

Pig Iron.—While the demand for Pig Iron has not materially increased, inquiries are good, conditions are considered favorable and every indication points to an active market for the near future. Furnaces have made no changes in their prices and we quote as follows for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry.....	\$14.25 to \$14.50
Southern, No. 2 Foundry.....	13.50 to 13.75
Southern, No. 3 Foundry.....	13.00 to 13.25
Southern, No. 4 Foundry.....	12.50 to 12.75
No. 1 Soft.....	14.00 to 14.25
No. 2 Soft.....	13.50 to 13.75
Gray Forge.....	12.50 to 12.75

Bars.—The demand for Bars is still very good and the main difficulty is in fulfilling the requirements of delivery. From some sources is reported plenty of inquiries for material which if accepted will keep the mills busy far into the new year. Prices are firm and we quote as follows: Iron Bars, 1.65c. to 1.75c.; Steel Bars, 1.70c. to 1.80c. Jobbers quote Iron Bars 1.95c. to 2c.; Steel, 2.05c. to 2.15c., full extras.

Rails and Track Supplies.—A strong demand for Rails, light and heavy, is reported, and it is impossible for the mills, with conditions prevailing, to meet demand and make prompt deliveries to customers. Inquiries are numerous and enough orders are now on the books to keep the mills busy well into the new year. The demand for Track Supplies continues active and we quote as follows: Splice Bars, 1.75c. to 1.95c.; Bolts, with Square Nuts, 2.75c. to 2.90c.; with Hexagon Nuts, 2.90c. to 2.95c.; Spikes, 2c. to 2.05c.

Pig Lead.—A normal demand for Pig Lead prevails. Prices are about the same. Soft Missouri is quoted at 4.25c. to 4.25½c. and Chemical at 4.30c. to 4.35c.

Spelter.—A better demand for Spelter is reported and orders are for fairly large quantities. Prices are higher and sells as high as 3.87½c.

Pittsburgh.

HAMILTON BUILDING, September 11, 1901.—(By Telegraph.)

Pig Iron.—One of the large Steel concerns were inquiring for a round block of Bessemer Iron. The concern are said to have bought about 10,000 tons from furnaces outside the Valley. The United States Steel Corporation are not inquiring for any Iron, but may possibly buy before this month is out if the strike is declared off. Forge and Foundry Iron continue quiet and prices are weak. We quote: Bessemer, \$15 to \$15.25, Valley furnace, or \$15.75 to \$16, Pittsburgh. Gray Forge is \$12.75 to \$13 at furnace, or \$13.50 to \$13.75, Pittsburgh; No. 2 Foundry Iron is \$14 to \$14.25, Pittsburgh, and reports are that even lower prices have been made.

Steel.—There is a good deal of inquiry for Steel in small lots for prompt shipment and it brings about \$25 at mill. No large lots are being asked for. Basic Open Hearth is quoted at \$26 to \$27, at mill.

Muck Bar.—We quote standard grades of Muck Bar at \$30.50, Pittsburgh.

(By Mail.)

The strike is still unsettled, so far as the Amalgamated Association is concerned, but with the United States Steel Corporation it is almost a closed incident, as that concern are rapidly getting their idle plants started, and within a short time, probably less than 30 days, every mill they own that can be operated will be running. Many of the men who were on strike have returned to work in the mills that have been started, and each day that goes by finds the men more discontented and showing a greater desire to go to work. The action of the men in the Bayview mills of the Federal Steel Company is proof of this. There are no special features to note in the Iron trade this week. The market all along the line is very strong and a large amount of tonnage in Finished Material is being placed. The mills are so far behind in deliveries and demand is so heavy that it will be some months before they have caught up with orders, and in the meantime any decline in prices does not seem likely. Pig Iron continues very dull, but there is a good deal of inquiry for small lots of Steel for prompt shipment.

Plates.—There is a moderate volume of tonnage, but demand is not so heavy as some time ago. The large consumers of Plates are taking out their usual tonnage, but have not as much work ahead as some time ago. This applies specially to the Steel car companies and also to the shipyards. There has been no change in prices and we quote: Tank quality, $\frac{1}{4}$ -inch and heavier, 1.60c.; 3-16-inch, 1.70c.; under 3-16-inch and above No. 10, 1.75c.; Flange or Boller Steel, 0.1c. advance over the base of Tank; Marine and Fire Box, American Boiler Manufacturers' Association specifications, 0.2c. advance over Tank; Still Bottom Steel, 0.3c. advance over Tank; Locomotive Fire Box Steel and equivalent specifications, 0.5c. advance over Tank, all f.o.b. Pittsburgh.

Rails.—There are several large inquiries in the market for Rails for next year, but so far not more than 100,000 tons have been placed, a Western mill taking the business. The Rail mills have all the tonnage they can take care of for delivery this year. We quote at \$28, at mill.

Ferromanganese.—We quote foreign Ferro at \$52.50, f.o.b. Pittsburgh, in large lots. Small lots of domestic Ferro continue to bring \$55 to \$60 a ton, delivered.

Structural Material.—Several fair sized lots have recently been placed. Among these are the addition to the reduction works at Niagara Falls, the Steel buildings of the Pittsburgh Steel Company at Monongahela and also for the Pope Tin Plate Company at Steubenville. The American Bridge Company have taken a good deal of tonnage lately. The Structural mills are busy and output this year will be the heaviest ever known. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inches, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.40c. to 1.45c., half extras, at mill; Universal

and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh.

Bars.—The price of Steel Bars for shipment within 30 to 60 days is firm at 1.50c., at mill, but there has been no change in the association price, which remains at 1.40c., at mill, half extras, with \$2 a ton advance for Open Hearth Bars. Where a buyer will place a contract without specifying delivery it could be placed at 1.40c., but there is no trouble in getting 1.50c. for Bars for prompt shipment. The mills are so far behind that it will take some months to catch up with accumulated orders. The price of Iron Bars for prompt shipment is 1.50c., Valley, and the mills are sold up for several months.

Sheets.—The situation as regards supply of Sheets is not any better, and they are still as hard to get and bring as high prices as ever. It is true that some of the independent Sheet mills have started and others will be ready in October, but most of these new concerns have their product sold up for two or three months, or longer. For delivery in this or next month we quote No. 27 Black Sheets from 3.75c. to 4c. and No. 28 at 4c. to 4.10c. On contracts for extended delivery No. 27 Black Sheets are about 3.25c. to 3.35c. and No. 28 3.35c. to 3.50c. Galvanized Sheets for prompt shipment are being sold by jobbers as high as 60 per cent. off. Contracts could be placed, however, for later delivery at about 70 to 70 and 5 off.

Merchant Steel.—There is nothing of interest to note. Prices on Shafting are reported to be firmer. We quote: Tire Steel, 1.60c. to 1.70c.; Toe Calk, 1.85c. to 2c.; Open Hearth Spring, 2c. to 2.10c.; Plow Slabs, 2c. to 2.10c.; Cold Rolled Shafting, 60 and 5 per cent. off in carloads, 60 per cent. in less than carloads; Sleigh Shoe Steel, 1.65c. to 1.75c.; Tool Steel, 7c. per lb. and upward, according to quality. On Tool Steel the mills allow freight east of the Mississippi River. A few mills quote Tool Steel as low as 6c., but do not allow freight.

Skelp.—There is a good deal of inquiry and the market is very firm. Most of the Skelp mills are sold up for some time ahead. Some of the Eastern mills are quoting Grooved Iron Skelp on the basis of about 2c., Pittsburgh. We quote Grooved Iron Skelp at 2c. to 2.05c. and Sheared at 2.05c. to 2.10c. We quote Grooved Steel Skelp at 1.90c. and Sheared at 2c. Skelp for prompt shipment is reported to have sold at higher prices.

Tubular Goods.—There is still a heavy demand for Pipe, but most buyers are placing orders only for small lots, believing that when the idle Tube mills get started they will be able to buy at much lower prices. Jobbers quote small lots of Pipe for prompt shipment as follows: $\frac{1}{2}$ to 1 inch, 40 per cent. off; Galvanized, 20 per cent. off; $\frac{1}{4}$ -inch, Black, 50 per cent. off; Galvanized, 30 per cent. off; $1\frac{1}{2}$ to 10 inch, Black, 55 per cent. off; Galvanized, 40 per cent. off. These prices, of course, are very much above the regular market, and are obtained only when the seller agrees to ship the Pipe out promptly. The leading Tube interest are still taking orders at old discounts for future delivery.

Connellsville Coke.—Output of Coke in the Connellsville region last week showed a decrease of about 12,000 tons over the previous week and a drop of nearly 40,000 tons in the two weeks. Nearly 500 ovens in the Connellsville region have been banked. Output last week was 207,399 tons and shipments 10,084 cars. The decrease in demand for Coke, together with large output, has resulted in low prices being made on some brands of Furnace Coke outside the Connellsville region. On spot shipment some of this Coke has been offered as low as \$1.40 to \$1.50 a ton. We quote strictly Connellsville Furnace Coke at \$1.75 to \$2 and 72-hour Foundry at \$2.25 to \$2.50 a ton. We quote Main Line Furnace Coke at \$1.50 to \$1.60 and Foundry \$1.75 to \$2 a ton, but note that in some cases Furnace has been offered below \$1.50 a ton.

Scrap.—There is a fair amount of inquiry for Scrap and some good sales are being made. Heavy melting stock is in good demand. With the termination of the strike and the starting up of so many idle mills demand

for Scrap will be much larger. The tone of the market is firm, but prices are not higher. We quote: No. 1 Wrought Scrap, \$15 to \$15.50, net ton; Cast Scrap, \$12; Busheling Scrap, \$12.50 to \$13; Turnings, \$11 to \$11.25; Borings, \$6.50 to \$7; Heavy Melting Scrap, \$14.50 to \$15; Car Wheels, \$15.50 to \$16; Old Iron Rails, \$19 to \$20, Valley mill.

Shafting.—Manufacturers advise us that the market on Shafting is a good deal firmer, and they are now quoting on the basis of 55 per cent. off in less than carloads and 60 per cent. off in carloads, delivered to points east of Mississippi River.

The offices of the Westmoreland Steel & Mfg. Company, manufacturers of Tool Steels, High Grade Steel Bars, Forgings, &c., formerly at Greensburg, Pa., where their works are located, are now at 315 Fourth avenue, Pittsburgh.

Cincinnati.

FIFTH AND MAIN STS., Sept. 4, 1901.—(By Telegraph.)

There has been a fair normal run of business the past week, quite a few 1000-ton orders have been booked, and the number of 300 to 500 ton sales have added considerable to the total tonnage. Most of the buying has been in Foundry grades, the greater portion being for this year's delivery, though most of the larger orders were for the first half of 1902. Prices are gradually stiffening, and it is not believed that there are any offerings whatever than the minimum figure given here. The outlook is for a fair steady trade with hardening price. Freight from Birmingham is \$2.75 to this point; from Hanging Rock district, \$1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$13.50 to \$13.75
Southern Coke, No. 2.....	13.00 to 13.25
Southern Coke, No. 3.....	12.50 to 12.75
Southern Coke, No. 4.....	12.00 to 12.25
Southern Coke, No. 1 Soft.....	13.50 to 13.75
Southern Coke, No. 2 Soft.....	13.00 to 13.25
Southern Coke, Gray Forge.....	12.00 to 12.25
Southern Coke, Mottled.....	12.00 to 12.25
Ohio Silvery, No. 1.....	15.00 to 15.50
Ohio Silvery, No. 2.....	14.50 to 15.00
Lake Superior Coke, No. 1.....	14.50 to 15.00
Lake Superior Coke, No. 2.....	14.00 to 14.50
Lake Superior Coke, No. 3.....	13.50 to 14.00
Southern Basic.....	13.75 to 14.00
<i>Car Wheel and Malleable Irons.</i>	
Standard Southern Car Wheel, chilling grades.....	\$18.25 to \$18.75
Standard Southern Car Wheel, No. 2.....	17.25 to 17.75
Lake Superior Car Wheel and Malleable.....	18.50 to 19.00

Plates and Bars.—The market is quiet, and prices are strong with an upward tendency. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.60c., with half extras; same in small lots, 1.80c., with full extras; Steel Bars, in carload lots, 1.55c., with half extras; Base Angles, in carload lots, 1.80c.; Plates, $\frac{1}{4}$ inch and heavier, 1.90c. to 2c.; 3-16 inch, 2.10c.; Sheets, No. 16, 2.90c. to 3c.

Old Material.—The conditions appear unchanged, market is steady. Car wheels are the strong point in quotations. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, per net ton, \$13.50 to \$14; Cast Railroad and Machine Scrap, \$12.25 to \$12.75; Iron Axles, \$19 to \$20; Iron Rails, \$17.25 to \$18.25; Steel Rails, rolling mill lengths, \$14.75 to \$15.25; short lengths, \$13.75 to \$14; Car Wheels, \$16.75 to \$17. All prices except No. 1 Wrought on the basis of gross tons.

The Belgian Iron Market.

BRUSSELS, August 23, 1901.

The crisis which has for so long a time hung over the metallurgical industries has become even more serious during July. Prices of fuel remain extremely high, the competition of the Germans is exceedingly active, and the high heat and vacation period have their influence. The Charleroi district is particularly suffering, and Pig Iron above all is affected. Blast furnaces continue idle, and mill and other Pig Iron is being offered to us from abroad. Still as the future of the rolling mills seems unsettled purchases are very much restricted.

This depression will be better understood by an examination of the following table, which gives the production and consumption during the first six months of the current year:

Pig Iron Production.

	Capacity per month. Metrical tons.
First six months 1901.....	62,850
Second six months 1901.....	87,300
First six months 1900.....	82,500
Second six months 1900.....	89,000

Pig Iron Imports, Exports and Consumption.

	First six months 1901. Tons.	Second six months 1900. Tons.	First six months 1900. Tons.
Production.....	377,070	523,787	494,720
Imports.....	83,858	198,773	174,318
Total.....	460,928	722,560	669,038
Exports.....	6,706	3,898	6,800
Consumption.....	454,222	718,662	662,238

Consumption, therefore, has fallen in Belgium from 718,662 tons during the first half of 1900 to 454,222 tons during the six months of the current year. Prices compare as follows:

Prices Per Metrical Ton.

	July 1, 1901.	January 1, 1901.	July 1, 1900.	January 1, 1900.
	Frances.	Frances.	Frances.	Frances.
No. 3 Luxembourg Foundry Iron.....	.60	.75	.105	.110
Luxembourg Mill Iron.....	.51	.55	.90	.100
Charleroi Mill Iron.....	.55	.60	.95	.105
Basic Pig.....	.65	.80	.110	.110

It will be observed, therefore, that the decline has been 50 francs, or 45 per cent. on No. 3 Luxembourg Foundry Iron, and even larger in some of the other grades. Intermediate products are not in a very much better position since the production during the first half of 1901 has declined 40,787 tons as compared with the second half of 1900. In the same time the consumption has declined 28,960 tons. Blooms are selling from hand to mouth at 97.50 francs, and Billets are going off fairly well at 102.50 francs. Muck Bars are being offered at 97.50 francs, but are in very poor demand. Old Material is quiet in spite of very heavy supply.

So far as finished products are concerned the situation has not very much improved. Business is particularly poor in Beams, the German competition being very active, and the prices for export being very low. German mills are offering Beams at 107.50 francs, f.o.b. Antwerp, while the Belgian mills cannot to the best of their ability accept orders at less than 110 francs under the same conditions. So far as the home market is concerned, although it is not quite so unfavorable, it is far from being satisfactory. It is true that pretty large orders are being placed for Merchant Bars both Iron and Steel, but prices are not remunerative. Iron and Steel Bars are quoted on the basis of 137.50 to 140 francs.

The Plate mills are fairly well occupied, but prices are far from favorable to the manufacturers. They remain for export trade for No. 2 Plates, according to specification, 14.25 to 14.50 francs net, Antwerp, with an extra of $\frac{1}{2}$ franc per 100 kg. for Steel Plates. The Bolt manufacturers are in a very difficult position in Belgium. No big business is doing and many of the mills are running only at 50 per cent. of their normal capacity. The larger construction shops have, however, undertaken big work and are furnishing the mills with good orders. The production of finished Iron and Steel during the first half of the current year has been larger than that of the previous six months.

Home consumption is also improving, which shows how our construction shops are well employed. Unfortunately the fact must be noted that our imports are steadily increasing, while our exports are declining. The following table gives the figures for the first six months of this year and the first and second six months of 1900:

Production, Exports, Imports and Consumption of Finished Iron and Steel.

	First six months, 1901. Tons.	Second six months, 1900. Tons.	First six months, 1900. Tons.
Production.....	431,990	420,728	505,816
Imports.....	50,232	44,990	44,236
Total.....	482,222	465,718	549,816
Exports.....	229,102	235,886	276,812
Consumption.....	253,120	229,832	273,812

Below are given the prices for export and for the home market of a number of finished articles:

Export Prices.			
	July 1, 1901.	January 1, 1901.	July 1, 1900.
No. 2 Bars	131.50	135.00	200.00
No. 3 Bars	136.50	140.00	205.00
Beams	117.50	140.00	180.00
No. 2 Iron Plates	145.00	155.00	210.00
No. 3 Iron Plates	155.00	169.00	239.00
Basic Steel Sheets	155.00	189.00	239.00
Iron Sheets	165.00	179.00	255.00
Steel Rails	115.00	135.00	160.00
Home Market.			
	137.50	140.00	210.00
No. 2 Bars	142.90	149.00	219.00
Beams	135.00	149.00	219.00
No. 2 Iron Plates	159.00	199.00	210.00
No. 3 Iron Plates	160.00	170.00	249.00
Basic Steel Plates	160.00	169.00	249.00
Iron Plates	170.00	180.00	260.00
Sheets	169.00	179.00	290.00

The position, as will be observed, is very much more critical from the point of view of prices than it is from the point of view of volume of business, production, export and consumption. Still there is a feeling of confidence as to a better future. The closing of the Chinese conflict will reopen to us the markets of the extreme Orient, and a more normal condition of affairs will be developed in order to sustain the rolling mills, who have lost so much money during the last year of crisis. If at least they could procure fuel at a lower figure the situation would improve, and it is with a certain satisfaction that our manufacturers observe the American project of exporting to Europe, and to Belgium in particular, their Bituminous Coals. The port of Antwerp would be very well situated for this business.

Metal Market.

NEW YORK, September 11, 1901.

Pig Tin.—The market has declined from day to day, the most noticeable feature being the entire disappearance of premium on spot. Owing to the fact that demand throughout the country runs more heavily in the direction of future deliveries spot is holding a relatively weak position. The business done in futures during the week has been noticeable for its volume. Our market to-day closes 24½c. to 25.50c. for spot September and October, with sales of spot and September at 25½c. October sold at 25c., November at 24.80c. and December at 24.60c. The London market to-day closed £114 10s. for spot and £111 17s. 6d. for futures. To-day's Billeton sale went at an equivalent of £110 c.i.f. Holland.

Copper.—There is no change. It is reported that some of the lake mines sold to home consumers for delivery up to the end of this year at 16½c. The contracts are said to have contained a clause protecting the purchaser as to price. Lake is quoted 16½c., Electrolytic 16½c. to 18½c. and standard brands of Casting at the same figure. Outside brands of Casting are, however, selling at 15½c. to 16c. The Baldwin Locomotive Works of Philadelphia are said to have purchased 300,000 pounds of Casting at 15½c. The London market was somewhat firmer, closing to-day at £67 8s. 9d. for spot and £67 17s. 6d. for three months' futures. Best Selected has advanced £1, and is quoted to-day £74. Thus far this month exports have amounted to 1750 tons, while imports for the same period aggregate 2300 tons.

Pig Lead.—There is no change and business is quiet. The American Smelting & Refining Company continue to quote 4.37½c. for Desilverized, New York, and 4.32½c., St. Louis. London is somewhat better, to-day's cable naming £12 1s. 3d.

Selter.—Is dull and still nominally quoted at 4c for spot and 3.95c. for future. St. Louis is dull at 3.80c., and London declined to £16 17s. 6d.

Antimony.—Is a shade easier. Hallett's is now quoted 8½c. and outside brands 8½c. Cookson's continues to be held at 10½c.

Nickel.—Is unchanged, prices continuing on a basis of 60c. for lots not covered by yearly contracts.

Quicksilver.—There is no change. The price quoted is \$51 per flask of 76½ lbs. in lots of 50 flasks and more. London is still quoted £9.

Tin Plate.—The situation is unchanged. As the American Tin Plate Company have succeeded in resuming operations in some of their mills, consumers are looking for relief and are only purchasing according to their urgent requirements. The American Tin Plate Company continue to quote on a basis of \$4.17 per box of standard 100-lb. Cokes, f.o.b. New York, and \$4, f.o.b. Pittsburgh. These prices are purely nominal, however, as the company are unable to make deliveries.

The Strike.

(By Telegraph.)

PITTSBURGH, PA., September 11, 1901.—While no official order has been issued by President Shaffer of the Amalgamated Association calling the strike off, it may be sent out at any time, and it is the general opinion that this week will see the end of the struggle. At the meeting of the General Executive Committee, held in Pittsburgh on Saturday and Monday, the committee by a unanimous vote instructed President Shaffer and the Advisory Board to end the strike on the terms proposed by C. M. Schwab, president of the United States Steel Corporation, to the committee of labor leaders which conferred with him in New York last week. The terms of the proposition made by Mr. Schwab to this committee and under which the General Executive Committee ordered President Shaffer to end the strike, are as follows:

"American Tin Plate Company—Will proceed under scale signed last year, except Star, Crescent, Banfield, Monessen and Demmler mills, which are now running and will continue to run nonunion."

"American Steel Hoop Company—Will sign for all mills signed for last year."

"American Sheet Steel Company—Will sign for all mills signed for last year, except Old Meadow, Saltsburg, Hyde Park, Canal Dover and Cambridge."

"With reference to our nonunion mills we will make no conditions with the Amalgamated Association, except giving the assurance that it is our intention to pay as high general wages in our nonunion as in our union mills."

For some reason President Shaffer has so far refused to order the men back to work, claiming that to do so would be equivalent to a surrender on the part of the Amalgamated Association.

At the meeting on Monday President Shaffer stated to the members of the Executive Committee that if they were dissatisfied with his course in the strike, and if they thought a settlement would be hastened by his resignation, he would resign his position at once. President Shaffer was assured that if he tendered his resignation it would be accepted. There is no denying the fact that great dissatisfaction exists among the officials and the men of the Amalgamated Association over the course pursued by President Shaffer during the strike, and it is probable his connection with the association will be terminated in a short time. He has acted repeatedly against the advices of the Advisory Board, while the men who went out on strike have been hoping for weeks that it would be declared off and they could go back to work. President Shaffer has held out promises that if the men would stand out for another week or two they would win the fight and all would secure their old positions. This had the effect of renewing the courage of the men, but at the same time the United States Steel Corporation were proceeding steadily in the starting up of their idle mills, and as fast as a mill has been started it has been taken from the union list and placed among non-union mills, to be operated in that manner always hereafter. Even should the strike be declared off and the United States Steel Corporation through their constituent companies sign the scale for their idle mills which were signed for last year, the Amalgamated Association, by reason of losing so many mills, will have been weakened very seriously and it will be many years before the association will be as strong as it was before the strike was ordered, if it ever gets that strong in membership again.

The officials see now that the strike was a mistake and are anxious to rectify it as far as possible, but President Shaffer is stubborn and refuses to call the strike off.

In the Tin Mills.

The American Tin Plate Company are making good progress in getting their idle tin mills started, and this week the Monongahela Works, an eight-mill plant in the south side, will be put in operation. A number of men from the Star and Monessen mills have been sent to the Monongahela Works, and the mill will start off with a very large number of skilled men at work. The Star, Demmler, Crescent, Monessen and Banfield mills will all be running to full capacity within the week. At the Demmler Works of the American Tin Plate Company the following notice was posted Tuesday evening:

"The present and former employees of the United States Works of the American Tin Plate Company are referred to the official statement of the company in the press August 27, as follows:

"The American Tin Plate Company deny that there are any negotiations on foot looking for a settlement of the strike, and authorize the statement that mills put into operation during the strike will be continued non-union and all men going to work now will be retained in their positions."

"The employees of this mill are hereby officially notified that this applies directly to the United States Works at Demmler, Pa., and that anything that has occurred or may occur in the future cannot affect the operation of this plant on a strictly nonunion basis. John R. Phillips, district manager; J. K. Lauck, superintendent; M. M. Leeds, third vice-president."

After the Monongahela Works are running full, the next tin plants to be started will be the Pittsburgh and Pennsylvania works, at New Kensington, about 20 miles from Pittsburgh.

The Hoop Mill Situation.

There is not much change in the situation among the hoop mills. The Painter, Clark, Lindsay & McCutcheon and Monessen works, in the Pittsburgh district, continue to run, and to nearly full capacity. The puddling department of the Painter Works was started up Tuesday night on night turn. No effort has been made to start the idle mills at Youngstown, Pomeroy and Warren, but the men formerly employed at these mills, and who have been idle about two months, are very much dissatisfied and are anxious to get back to work. When these mills are started, which will likely be very soon, it is believed more than half of the men will go back to work.

In the Sheet Mills.

The American Sheet Steel Company have in full operation more than 60 per cent. of their total number of sheet mills, and the list is steadily growing. The Reeves Works, at Canal Dover, are running practically full. It is probable one or two other works, among them the Wood plant at McKeesport, will be started within a short time.

The Tube Mill Situation.

The first violence in the tube mills was committed at the National Tube Works on Tuesday evening, when two men at the plant were assaulted and seriously injured. From 400 to 500 men are working at the National Tube plant, and hundreds of others would go to work but are afraid to do so. The National Tube Company will take steps to-day or to-morrow to institute injunction proceedings to prevent the McKeesport strikers from interfering with the operation of the National works. The Pennsylvania and Continental tube works in Pittsburgh and the Riverside works at Wheeling are still idle, with the exception of a few departments. It is probable that a determined effort will be made to get the National Tube Works running full, and after this is done the other three idle plants will be started. The men who are idle and who see their positions being taken by other men are hoping that they will be ordered to go to work before this week is out.

The strike is in that condition that it may be called off any minute.

The Strike Ended at Milwaukee.

CHICAGO, ILL., September 9, 1901.—The Illinois Steel Company started their Bay View rolling mills at Milwaukee, Wis., on Monday, the 9th inst. Over half of the force of old employees applied for work when the gates were opened. Notice had been given last week to the strikers that the Illinois Steel Company would start the Milwaukee plant on Monday whether the men voted to return to work or not. They were informed that even if they did vote to return to work they could not do so as an organization affiliated with the Amalgamated Association, but only as a local organization. The report is erroneous that this notice was given by President Schwab of the United States Steel Corporation. Mr. Schwab is not concerning himself directly with the operations of the mills belonging to the constituent companies of the United States Steel Corporation. The order in question was issued by the officials of the Illinois Steel Company. The Milwaukee workmen held a meeting of their lodge on Sunday afternoon and failed to agree either on the proposition to return to work or to continue the strike. The sentiment of a large number of men was, however, clearly in favor of returning to work. Their action on Monday was in accordance with the position they took on Sunday. This ends the strike at Milwaukee, as either the remainder of the men will speedily return to work or their places will be filled by others.

Much interest is now taken in the attitude of the strikers at the company's works in Joliet. It is believed that they will follow the example of their colleagues at Milwaukee, and that the Joliet works will soon be in operation. The Illinois Steel Company have not yet taken any active measures looking to the reopening of the Joliet works, preferring to first get the Milwaukee works in active operation. It is known that a large number of the Joliet workmen are anxious to resume, and are only awaiting a favorable opportunity.

Washington Charcoal Iron Tin Mills.—PITTSBURGH, PA., September 11, 1901.—(By Telegraph.)—McClure & Co., dealers in tin plate and metals, whose offices and warehouses are located at 211, 213 and 215 Second avenue, Pittsburgh, Pa., with branch warehouse at 115 North Seventh street, Philadelphia, Pa., have recently purchased a large majority of the stock of the Washington Charcoal Iron Tin Mills, at Washington, Pa. McClure & Co. have always been stockholders in this concern, but desired a change in the management. They will continue to sell the entire output of the plant, which at the present time amounts to a daily output of 750 base boxes, and can assure the trade very much better service under the present management. It is the intention to double the capacity of the works in the very near future. New officials have been elected as follows: Thomas G. McClure, president; J. J. O'Connor, vice-president, and P. J. McNulty, secretary and treasurer.

No New Sheet Mill at Cambridge, Ohio.—Following upon a rumor to the effect that the Cambridge plant of the American Tin Plate Company would be dismantled, a report was circulated to the effect that A. W. Brown, who was formerly president of the Cambridge Iron & Steel Company and until recently vice-president of the American Sheet Steel Company, would build a new mill to supplant it. We are advised by Mr. Brown that such statements are absolutely untrue, as he has no intention of building either tin or sheet mills.

The Waterbury Farrel Foundry & Machine Company of Waterbury, Conn., have planned extensive additions to their already large plant. The improvements comprise a large office building, new machine shop, smithing shop and power house. The latter will be fitted for belt and electric transmission for the present, but eventually it is proposed to operate the entire establishment electrically. This change will be made gradually, as may be most convenient. The changes will double the capacity of the works.

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING SEPTEMBER 11, 1901

Cap'l Issued.	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.	Closing		
							quotations.	Sales.	- 3½ 3½ 100
\$10,000,000 Am. Bicycle Co., Com.	.....	.....	.....	.....	.....	.....	- 3½	3½	100
20,000,000 Am. Bicycle Co., Pref.	.....	.....	.....	.....	.....	.....	.....	.....	.....
10,000,000 Am. Bicycle Co., Bonds	.....	69½	.....	.....	.....	.....	.....	.....	.....
29,000,000 Am. Car & Foundry, Com.	30½-31	30-30½	28-29½	28½-29½	29½-29½	29½-29½	29½-29½	29½-29½	29½-29½
29,000,000 Am. Car & F'ndry, Pref. \$	87-87½	87	84-85½	83½-85½	85½-87	86½	86½	86½	2,100
7,500,000 Bethlehem Iron†	.....	.....	.....	.....	.....	.....	.....	.....	.....
15,000,000 Bethlehem Steel††	.....	.....	.....	.....	.....	.....	.....	.....	.....
7,974,550 Cambria Iron, Phila.*	48½-48½	.....	.....	.....	.....	48½	.....	.....	50
45,000,000 Cambria Steel*†	26½-27½	26½-26½	24½-25½	25-25½	25½-26½	25½-26½	25½-26½	25½-26½	43,885
17,000,000 Colorado Fuel & Iron	102-104	99½-102½	93-95½	95½-97½	97½-100	99-100	99	99	39,785
24,410,900 Crucible Steel, Com.	.....	.....	.....	.....	.....	.....	.....	.....	.....
24,399,500 Crucible Steel, Pref.	.....	.....	.....	.....	.....	.....	.....	.....	.....
1,975,000 Diamond State Steel §§	- 3	.....	- 2½	.....	.....	.....	3	700	.....
15,000,000 International Pump, Com.	44½-45½	45-46½	44	43½-45	45-46	46-46½	46½	6,500	.....
8,850,000 International Pump, Pref.	.....	.....	.....	- 85	.....	.....	.....	300	.....
11,000,000 International Silver	.....	- 7½	.....	.....	7½-7½	7-7½	7½	900	.....
10,750,000 Penna., new, Com., Phila.	- 47	.....	- 47	.....	.....	.....	.....	150	.....
16,500,000 Penna., new, Pref., Phila. \$	.....	- 87½	.....	.....	- 87	- 87	.....	200	.....
12,500,000 Pressed Steel, Com.	.....	- 42	39-40	40-41½	41½-42	41-41½	41½	1,800	.....
12,500,000 Pressed Steel, Pref.	.....	- 82	79-82	78½-82½	81½-82	.....	.....	1,800	.....
27,191,000 Repub. Iron & Steel, Com.	18½-19½	18½-19	17½-18½	17½-18½	18-18½	17-18½	17	20,400	.....
20,306,900 Repub. Iron & Steel, Pref.	73-73½	72½-74	70-72	71-72	71½-72	69-71½	69	14,750	.....
7,500,000 Sloss-Sheffield S. & I., Com.	- 31½	- 31½	30-30½	.....	.....	.....	.....	400	.....
6,700,000 Sloss-Sheffield S. & I., Pref. \$	.....	.....	.....	.....	.....	.....	.....	.....	.....
20,000,000 Tennessee Coal & Iron	66½-68%	66½-67½	60½-62½	61½-63½	63½-65½	64-65%	64	34,600	.....
1,500,000 Tidewater Steel†	- 6%	.....	- 6%	.....	.....	.....	.....	300	.....
510,361,300 U. S. Steel Co., Com. ||	45½-45%	44½-45½	41-43	42½-43½	43½-45½	44-45½	44	242,600	.....
508,511,200 U. S. Steel Co., Pref. ||	95-95%	94½-95½	91½-92½	92-93½	93½-95½	93½-95	94½	119,500	.....
1,500,000 Warwick I. & S. ||	- 7	.....	- 7	- 50	.....	.....	.....	350	.....

Preferred stocks 7½ cumulative unless otherwise stated. § 7½ Non-Cu. §§ New stock. ¶ Par \$10. †† Par \$50. \$1 paid in. || Authorized Capital \$550,000 Common; \$555,000 Preferred; * Par \$50. + 6½% guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph. ¶ Ex-dividend.

Bonded Indebtedness: American Bicycle Co., \$10,000,000 sinking fund gold debentures 5%; Cambria Iron Co., guaranteed 4½ per annum on \$50 par by Cambria Steel Co.; Cambria Iron Co., \$218,000 6½ debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Diamond State Steel Co., property leased from Diamond State Steel Co. at 4½ on \$1,000,000, \$7.50 on Steel stock paid in, total capital \$2,000,000; International Pump: Blake & Knowles S. P. Co. \$1,000,000 6½; Tennessee C. I. & R. R. Co., \$8,367,000 6½, \$1,114,000 7½, \$1,000,000 7½ cu. pref.; Pennsylvania Steel, \$1,000,000 5% Steelton 1st, 1917, \$2,000,000 5% Sparrow's Point 1st, 1922, \$4,000,000 consolidated, both plants; Bethlehem Iron, \$1,351,000 5% maturing 1907, interest and principal guaranteed by Bethlehem Steel Co.; Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co., Col. Fuel Co. Gen. Mort. 6½ \$890,000, Col. Coal & Iron Co. Mort. 6½ \$2,643,000, Col. Fuel & Iron Gen. Mort. 5½ \$2,674,000, also outstanding \$2,000,000 preferred stock; Sloss-Sheffield S. & I. Co., Sloss I. & S. first mortgage 6½, \$2,000,000, Sloss I. & S. general mortgage 4½ \$2,000,000. U. S. Steel Corporation \$304,000,000 5% gold bonds, also Am. S. & W. Co. \$190,656, Federal Steel Co. \$9,822,000 Illinois 5%, \$7,417,000 E. J. & E. R. R. 5½, \$1,600,000 Johnson 6½, \$6,732,000 D. & I. R. R. 5½ \$1,000,000 2d D. & I. R. R. 6½, \$10,000 land grant D. & I. R. R. 5%; National Steel \$2,561,000 6½.

Iron and Industrial Stocks.

On the whole the week has been one of general recovery in the iron stocks, the decline on Saturday resulting from the attack on the President having been only temporary. Republic issues were weak at the close on the annual report, which shows that only a part of the preferred dividend was earned during the year owing to special circumstances.

	Bid.	Asked.
E. W. Bliss, common	143½	..
E. W. Bliss, preferred	130	140
Cramp's Shipyard stock	79	82
Empire Iron & Steel, common	4	5
Empire Iron & Steel, preferred	30	35
National Enam. & St., common	26	28
National Enam. & St., preferred	84	87
New Haven	5	5½
Otis Elevator, common	32	33
Otis Elevator, preferred	96	98
Pratt & Whitney, preferred	85	90
U. S. Cast Iron Pipe Company, common	6	7
U. S. Cast Iron Pipe Company, preferred	33	35
U. S. Projectile	119	..
Va. C. I. & C., stock	5	7
Va. C. I. & C., bonds	43	45
H. R. Worthington, preferred	111	112
American Can Company, common	24	24½
American Can Company, preferred	74½	74½

A syndicate of Pittsburgh capitalists, headed by Charles A. Painter, have formed a combination of 96 per cent. of all the firms in this country manufacturing laundry machinery. The corporation will be chartered under the laws of New Jersey with the title of the American Laundry Machinery Mfg. Company. The capital will be \$16,500,000, of which \$8,000,000 will be preferred stock and the remainder common. Pittsburgh banks will have charge of the subscriptions.

The annual meeting of the stockholders of the Crucible Steel Company of America of Pittsburgh will be held on Wednesday, October 16, in New Jersey. The

annual statement of the company is being prepared for the meeting, and, it is said, will be very satisfactory.

Dividends.—The New Haven Iron & Steel Company have declared a dividend of 20 cents per share, payable September 25. Books close September 14 and reopen October 3.

The Otis Elevator Company have declared the regular quarterly dividend of 1½ per cent. on their preferred stock, payable October 15. Books close September 25 and reopen October 16.

The Sloss-Sheffield Steel & Iron Company have declared the regular quarterly dividend of 1¾ per cent. on their preferred stock, payable October 2. Books reopen October 1.

In July the coal shipments from England and Wales to foreign ports were 3,040,515 tons, as against 3,117,528 tons in July, 1900, and from Scotland 444,473 tons, as against 490,913 tons; the shipments coastwise from England and Wales to London and other British ports were 1,172,769 tons, as against 1,237,812 tons and from Scotland 144,704 tons, as against 127,932 tons.

Last year the 76 mines actively worked in the Grand Duchy of Luxemburg, employing 6,207 workmen, produced 6,171,229 tons of iron ore, valued at 17,283,289 francs, against 5,995,412 tons in 1899, valued at 16,225,280 francs. In 1900 the mean price per ton was 2 francs 80 cents, against 2 francs 70 cents in 1899. The total production of pig iron diminished, however, from 982,930 tons in 1899 to 970,885 tons last year, although the value increased from 55,740,319 francs to 74,234,178 francs, giving mean prices per ton of 56 francs 70 cents and 76 francs 46 cents respectively.

There are rumors to the effect that a large new issue of stock of the Amalgamated Copper Company is to be made to acquire additional property.

The New York Machinery Market.

NEW YORK, September 11, 1901.

Two contracts were awarded to-day which are by far the largest machinery orders given out in this country this year. One is for engines and the other for boilers, the awards having been made by the Subway Construction Company, who are constructing and will equip the New York Rapid Transit Railroad. The order for the engines was given to the Allis-Chalmers Company and the Babcock & Wilcox Company secured the boiler contract. The apparatus is to be used in the generation of electricity, which will be used as motive power in operating the cars in the tunnel.

The engine contract provides for eight units each of a capacity of 7500 horse-power when operating at best efficiency and developing a maximum of 11,000 horse-power. The engines will run 75 revolutions per minute at 175 to 200 pounds of steam pressure. They are to be built according to special specifications prepared by the Subway Company. Each engine will consist of two combined component engines operating on one shaft. Each component engine is to have a vertical low pressure cylinder and a horizontal high pressure cylinder, both cylinders connecting to one crank pin.

The order awarded to the Babcock & Wilcox Company calls for 48 horizontal water tube boilers, divided into 24 batteries. Each boiler is to be of 1200 horse-power (15 pounds basis), and they are to be of the regular B. & W. type, with slight alterations, which are to allow for their adaptation to superheating apparatus.

Each of the engines is to be direct connected to a generator, which will be rated at 5000 kw. The generators will be of the revolving field fly wheel alternator type and have not yet been contracted for.

Thus far the engines and boilers are the only apparatus that have been ordered. Specifications will soon be commenced for the stokers, condensers, pumps, &c. It is expected that these matters will be in shape for figuring by the middle of November. The location for the proposed monster power station has just been decided upon, but the officials of the company are not disposed to reveal it at this time.

Aside from the general interest which the public has taken in this project, members of the trade are following it very closely. This is the fifth great electric power station projected for Manhattan Island. Four of these are now in process of erection, their equipments having been purchased from time to time during the last three years. Various systems were employed in the different plants and the trade look with interest toward the selection of equipment for this latest plant. With the experience of the engineers in the matter of the four early plants the engineers of the Subway Company had a wide field to select from. Now that the question of boilers and engines has been settled interest will continue in the other branches.

Builders of boilers are considerably perturbed over the high prices of plates and tubes, and while there have been no advances in prices as yet, the trend of the material market is being watched carefully. The high prices and scarcity of angles and other structural materials is also having an effect on the trade. Instances are cited where the erection of manufacturing plants is being delayed and in some cases postponed owing to the difficulty in obtaining the regular structural materials for the construction of the buildings.

In the machine tool trade the largest transaction of the week was a \$40,000 order placed by the Missouri & Pacific Railroad. The order was given to the Niles-Bement-Pond Company. It included the general line of railroad shop tools. They are to be installed in a new repair shop to be located at Bearing Cross, Ark.

In connection with an addition to their works the American Ordnance Company of Bridgeport, Conn., have just ordered from Woolston & Brew of 39 and 41 Cortlandt street a 300 horse-power Ball compound condensing engine.

There has been a rumor in the trade to the effect that a large new smelting works is to be established at Carteret, N. J. In looking into the matter we find that

Samuel Goldsticker, a real estate broker of 111 Broadway, New York, has sold a tract of land at Carteret, having a frontage of about a quarter of a mile on the Kill Von Kull, to J. R. De La Mar. Mr. Goldsticker states that the purpose of Mr. De La Mar is to erect a large smelting works on the site to cost about \$900,000. He will also build houses for the workmen, of which it is calculated that there will be upward of 1000. For the last ten days Mr. De La Mar has been in the West, and it is not expected that he will return for two weeks. When he returns he will make his headquarters at the office of Mr. Goldsticker.

It is reported in the street that the Anchor Fence Post Company are making overtures toward the erection of a large new plant at Garwood, N. J. The Merke Chemical Company of Rahway, N. J., are inquiring about equipment for a new plant which they are about to erect in that city. Besides boilers, engine, &c., they contemplate purchasing a considerable quantity of special machinery.

Frederick A. Verden, ship chandler of Hoboken, N. J., is making inquiries preparatory to the erection of a new plant.

In connection with the new plant of the Georgia Electric Light & Power Company, Ford, Bacon & Davis, consulting engineers, of 85 Liberty street, have just placed a contract for forced draft apparatus with the Buffalo Forge Company. It will be a 4000 horse-power plant, the order for the boilers having previously been awarded to the Babcock & Wilcox Company.

A short time ago it was rumored that a large European concern building cream separators intended building a plant in this country. We are now informed that this concern have sent a representative to this country who is expected to arrive this week, but that instead of erecting a plant the company intend disposing of the American rights to such parties as may be interested in this country. The gentleman now *en route* will endeavor to make such arrangements upon his arrival.

Hugh Kelly of 71 Wall street, who has been prominent in the trade as a purchaser of machinery for the equipment of sugar plants, which he has promoted, is said to have a batch of new work, for which he is now arranging to make extensive purchases. The latest project is said to be that of the South Porto Rico Sugar Company, who will erect a new plant in Porto Rico.

The branch house in Barcelona, Spain, of the A. Andujar Company, 136 Front street, New York, advise the firm that there is a great demand for all kinds of machinery, but most particularly electrical machinery, in that country. They desire to secure the exclusive agency of some reliable manufacturers. They desire to receive catalogues, &c., from manufacturers in these lines.

Serrell, White & Cie. of Paris have undertaken the establishment of a number of selling houses throughout France for the A. S. Cameron Steam Pump Works of New York. An order for a number of service pumps was received this week, this being the second order from the Marseilles district. The local branch of the above concern is Serrell & White, at 18 Broadway.

The United States Consul at Rouen, France, reports that a novel idea in the fire extinguishing service has been introduced by the head of the fire department in that city. Inasmuch as the city is traversed everywhere by electric trolley wires, it is proposed to provide pumps driven by dynamos, to take currents by means of a trolley hooked to the street car wires at the nearest point to the fire.

Although Arthur Keen, chairman of Guest, Keen & Co., at Birmingham, has given no definite corroboration of the rumors in circulation this week that a combination of that firm and Crawshay Brothers is about to be carried through, the English papers say that there is little doubt that some scheme aiming at the consolidation of South Welsh iron and steel interests is in the tentative stage.

HARDWARE.

MANUFACTURERS as the employers of labor have been watching the course of the Steel strike with more solicitude and care than the general public or even the commercial classes. It has affected many of them more or less directly in its influence on the market for the raw material, but is at least equally interesting from its bearing on the relations between employers and their workmen.

From the very outset of the strike there has been little doubt in the minds of informed observers as to its outcome. The questions remaining are merely as to the extent of the defeat of the Amalgamated Association and the terms of settlement. Unless all signs fail, this strike has marked a new phase in the history of organized labor. Despite the popular outcry against trusts, general sympathy is unmistakably arrayed on the side of the United States Steel Corporation. Sober minded and conservative men have reached the conclusion that whatever may be the right of labor to organize, the right of the individual to work must be paramount to every other consideration. It is a hopeful sign when even a political convention declares that while in favor of organized labor, it is still more in favor of law and order. Unfortunately for the Amalgamated Association, it has learned little from its past defeats and its numerous mistakes, so that it typifies that radical element in union labor which seeks to enforce its views by intimidation. Fortunately there remains a vast number of labor organizations who do not thrust themselves into public prominence with strikes and broken contracts, but whose ways are rather those of peace and conciliation. To those to whom organized labor is more than a passing phase there comes the hope that the acute phase of the trouble is slowly passing away, to be replaced by a quieter and more orderly course.

The cry for arbitration in this strike has been much less strenuous and insistent than usual, for the conviction is slowly growing that what was once exploited in the daily press as a panacea for all labor troubles is but a poor dependence in cases of serious differences. It is difficult to apply it in the first instance, since it cannot be made compulsory, and it is usually accompanied by the illogical suggestion of selecting as arbitrators some prominent men noted for their character and probity, but entirely ignorant of the complex relations of employer and employee, and entirely unfitted either by training or experience to pass upon the business questions involved.

One of the most interesting results of the strike has been the greatly strengthened position of the United States Steel Corporation as a thing to be permanently reckoned with in the industrial world. Prophets were not wanting who foretold at the very inception of the organization that a great labor strike would some day paralyze the energies of the great concern, bringing impotence and disaster in its train. The Corporation will apparently emerge stronger than ever from the conflict, and with removal of the dark cloud that threatened their future. In this case a great industrial consolidation has shown a wisdom and energy which have done much to confirm the public confidence.

Condition of Trade.

The volume of business is excellent and both jobbers and retailers are covering their wants in nearly all lines with liberal orders. Most of the larger trade have already purchased goods for the season's business and are buying now to complete, or perhaps replenish in some cases, their stocks. The delay on the part of the manufacturers in making shipments causes a good deal of correspondence, and in some lines serious inconvenience is occasioned by the scarcity of goods. This is the case especially in Tin Plates and Sheets and goods in the manufacture of which these products are used. In many other lines, however, the difficulty of obtaining raw material is delaying the output of goods. The stocks of Heavy Hardware in the hands of manufacturers and jobbers are generally light. Prices as a rule are decidedly firm, especially in heavy goods. The effect of the strike in interfering with the operation of the mills is felt in several directions in giving a temporary strength to the market and causing higher prices for the time being. In lines in which there is a decided scarcity, as, for example, Wrought Pipe, those who have stocks on hand are advancing prices and reaping good profits. With the indications of a speedy termination of the Steel strike, and with the good news of the President's steady and rapid recovery, the market is regaining the confident tone which was for a time disturbed by the attempted assassination, and the prospect of an active and satisfactory fall business is excellent.

Chicago.

(By Telegraph.)

Jobbers express surprise at the heavy volume of business which their books show with scarcity prevailing in so many lines. August was the largest month ever known in the history of the local Hardware trade, and yet during the whole of the month stocks of many staple articles were so short that many orders could not be filled and it seemed as though a great deal of business was being lost. The month of September starts off with a rush, indicating a continuance of the heavy trade of August. This month finds jobbers with absolutely no Tin Plate on hand, very few Steel Sheets of any kind and badly broken stocks of all classes of manufactured goods made of Tin or Sheet Steel. Wire goods are likewise running short, the filling of orders depending entirely on prompt shipments from mill or factory. Jobbers are steadily in receipt of complaints from disappointed customers, who profess to be unable to comprehend why their orders are not being filled more promptly. This has been a phenomenal year for the Hardware trade, as the usual summer dullness failed to put in an appearance. It now seems probable that the demand will be heavy for the remainder of the year, as the fall season brings with it a new set of requirements which must be met by Hardware dealers.

St. Louis.

(By Telegraph.)

There seems very little news to report in the Hardware trade of this section, the active and strong demand which has been prevailing continues and prospects for the immediate future are very promising. Complaints are still heard on account of delay in the delivery of certain lines of material from the mills, such as Tin Plate, Light Sheets, &c. All plans are laid to care for a very large and active fall demand, and it is hoped and expected with an early settlement of the strike factor that the naturally prosperous condition of business will assert itself in this line.

NOTES ON PRICES.

Wire Nails.—Business in Wire Nails keeps up to large proportions, and in the main at regular prices. Some trouble is experienced in obtaining prompt shipments from the mills, which are unable to accumulate stocks.

The export demand continues steady, and the volume of business in the aggregate is considerable. Quotations for domestic trade are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.30
To jobbers in less than carload lots.....	2.35
To retailers in carload lots.....	2.40
To retailers in less than carload lots.....	2.50

New York.—Local demand is satisfactory for Wire Nails, and prices are firm at the following quotations: To retailers, carloads on dock..... \$2.53 Small lots at store..... 2.60

Chicago, by Telegraph.—Manufacturers report an active demand for Wire Nails. Jobbers are placing contracts freely. These contracts are of such a character as to indicate that the buyers are confident of a heavy fall trade. The factories are now without stocks and jobbers report difficulty in securing prompt deliveries. The local jobbers are enjoying a heavy trade which promises to continue, as the season of an active fall demand is now at hand. Prices are maintained at \$2.45 for carloads and \$2.50 for small lots.

St. Louis, by Telegraph.—There are no signs of let up in the demand for Wire Nails, and stocks are being fast depleted. There seems to be a very hopeful feeling that the end of the labor disturbance is near at hand, and that the manufacturers can then supply all requirements. We quote carload lots to retailers at \$2.50, base, and less than carload lots at \$2.55 to \$2.60.

Pittsburgh.—There is a good volume of business in Wire Nails, demand keeping up in spite of the lateness of the season. Concessions in prices continue to be made, mostly for Southern points of delivery. The general tone of the market, however, is firm. We quote f.o.b. mill, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.30
To jobbers in less than carload lots.....	2.35
To retailers in carload lots.....	2.40
To retailers in less than carload lots.....	2.50

Cut Nails.—The scarcity in standard sizes of Cut Nails is becoming so pronounced that shipments are delayed in consequence. Some mills report that they are two weeks or more behind orders. This condition is the result of the difficulty in obtaining material from which to cut Nails. Export prices for Cut Nails are higher in proportion than those for Wire Nails, although they are lower than the rates for domestic trade. The volume of export business is not large at present. Quotations for domestic trade are as follows, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....	\$2.05
Less than carload lots.....	\$2.10 to 2.15

New York.—Cut Nails are being ordered in about the usual volume. The advance in price of 5 cents per keg is not exacted in all cases on purchases from store. New York quotations for carload and less than carload lots are based on the above prices, to which Pittsburgh freight is added:

Carload lots on dock.....	\$2.18
Less than carload lots on dock.....	2.23
From store.....	\$2.18 to 2.30

Chicago, by Telegraph.—No marked change has occurred in the character of the trade. Jobbers quote small lots from stock at \$2.35. An error was made in the quotation as printed last week.

St. Louis, by Telegraph.—There is nothing new to report in the Cut Nail market. The demand continues good and prices firm. Small lots from store are quoted at \$2.30 to \$2.35.

Pittsburgh.—In spite of the advance of 5 cents per keg made by the Cut Nail mills, it is claimed some of the jobbers are still selling at old figures. There is a good demand, and some of the mills are somewhat behind in deliveries and unable to furnish a full assortment of sizes promptly. We quote, f.o.b. Pittsburgh, plus Tube freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....	\$2.05
Less than carload lots.....	2.10

Barb Wire.—The demand for Barb Wire continues active, especially from the West and Southwest. Since the first of the month Eastern buyers have been ordering more freely and find it difficult to get prompt shipments. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....	\$2.60
To jobbers in carload lots, Galvanized.....	2.90
To jobbers in less than carload lots, Painted.....	2.65
To jobbers in less than carload lots, Galvanized.....	2.95
To retailers in carload lots, Painted.....	2.70
To retailers in carload lots, Galvanized.....	3.00
To retailers in less than carload lots, Painted.....	2.80
To retailers in less than carload lots, Galvanized.....	3.10

Chicago, by Telegraph.—Orders now being booked for Barb Wire aggregate a huge tonnage. The manufacturers are making somewhat better delivery and jobbers therefore come more nearly to satisfying their customers. The prospects for the fall trade indicate a very heavy movement. Carload lots are quoted at \$2.75 for Painted and \$3.05 for Galvanized. Less than carloads are quoted \$2.85 and \$3.15 respectively, with these prices firmly held.

St. Louis, by Telegraph.—Since our last report business conditions have not changed and an active and strong demand for Barb Wire prevails. Jobbers quote carload lots of Painted at \$2.85 and Galvanized at \$3.15; less than carload lots are quoted at \$2.95 for Painted and \$3.25 for Galvanized.

Pittsburgh.—Demand for Barb Wire continues heavy and the output of the mills is shipped about as fast as made. At some points the mills are behind in deliveries, being unable to keep up with demand. The tone of the market is strong and for domestic trade we quote: Galvanized Barb Wire, \$2.90, in carload lots to jobbers, and Painted, \$2.60. Terms 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

Plain Wire.—The volume of business in Plain Wire continues large. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

Base sizes.	Plain.	Galv.
To jobbers in carload lots.....	\$2.25	\$2.65
To jobbers in less than carload lots.....	2.30	2.70
To retailers in carload lots.....	2.35	2.75
To retailers in less than carload lots.....	2.45	2.85

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9.....Base.....	\$0.40 extra.
10.....\$0.05 advance over base.....	.40 "
11......10 "	.40 "
12 and 12½. .15 "	.40 "
13......25 "	.40 "
14......35 "	.40 "
15......45 "	.75 "
16......55 "	.75 "
17......70 "	1.00 "
18......85 "	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Chicago, by Telegraph.—The increased output of Barb Wire is evidently at the expense of the supply of Smooth Wire, as the mills are falling further behind in deliveries of this class of material. The demand was never before so heavy for Baling Wire and Bale Ties. Jobbers find the demand for such products far beyond their ability to fill. Carload lots of Wire are held at \$2.40 and small lots from stock at \$2.50.

Pittsburgh.—Demand for Plain Wire continues heavy and has shown very little, if any, falling off. The mills are shipping their Wire as fast as it is turned out. The tone of the market is strong and for domestic trade we quote:

To jobbers in carload lots.....	\$2.25
To jobbers in less than carload lots.....	2.30
To retailers in carload lots.....	2.35
To retailers in less than carload lots.....	2.45

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days net, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh.

Oilers.—There has been an advance by several of the manufacturers of Zinc, Brass and Copper Oilers, and prices on these goods are about 10 per cent. higher.

Chain.—The manufacture of Chains is seriously interfered with by the existing strike, and there is a good deal of difficulty in obtaining goods. Under these circumstances some of the manufacturers are withdrawing quotations as not in a position to execute orders with promptness. Manufacturers or jobbers who have a stock of Chain on hand are able to realize higher prices.

Registers, Ventilators, &c.—A new and thoroughly revised list, bearing date September 2, has been adopted by several of the leading manufacturers of Hot Air Registers, Ventilators, &c. An important change, and one which serves the convenience of the trade, is in making the different finishes of Registers subject to a uniform discount. This line of goods has for some time been characterized by much unevenness of price, especially on the common goods and sizes most in demand, the manufacture of which has been taken up by new concerns. While there is still some irregularity in the prices of the different manufacturers this is a time of the year when there is an active and urgent demand for this line of goods and manufacturers who have complete stocks from which orders can be promptly filled are in a position to obtain somewhat better prices than a short time ago. The new lists on Black Japanned and White Japanned Registers are given below and the discounts applying to these and other finishes and related goods are as follows, terms 60 days net, or 2 per cent. discount for cash in 10 days:

Black Japanned Registers, Ventilators, Faces and Borders 70 %
White Japanned Registers, Ventilators and Faces (separate list) 70 %
Bronzed Finishes in imitation of Gold, Silver, Copper and Bronze 70 %
Nickel Plated 70 %
Electroplated in Brass, Bronze, Copper, Oxidized Silver 70 %
Wall Frames 70 %
Heavy Round Gratings 70 %
Ventilating Plates 70 %
Cold Air Inlets 70 %
White Porcelain Enamel Registers, Ventilators, Faces and Borders 60 %
Solid Brass and Bronze Metal Registers, Ventilators, Faces and Borders 50 %

Registers, Black Japanned.

List Sept. 2, 1901. Price each.

Size of opening.	Register face.	Floor border.	Size of opening.	Register face.	Floor border.	Size of opening.	Register face.	Floor border.																																																																																																																																																																																						
4 1/2 x 6 1/2	1.40	0.50	0.90	1.65	1.00	1.05	12 x 16	5.60	3.00	3.00	12 x 17	6.35	3.50	3.25	12 x 18	6.80	3.70	3.35	12 x 19	7.15	4.00	3.50	12 x 20	9.00	4.40	4.00	12 x 21	12.25	5.20	5.20	12 x 22	20.00	7.20	7.00	12 x 23	25.60	9.50	8.20	12 x 24	26.75	11.00	9.00	12 x 25	22	22	22	14 x 14	7.90	3.80	3.60	14 x 15	8.25	3.95	3.95	14 x 16	8.50	4.00	4.00	14 x 18	9.00	4.25	4.25	14 x 20	9.50	4.50	4.45	14 x 22	10.50	5.00	4.85	14 x 24	46.00	20.00	18.00	14 x 25	17.50	7.20	6.25	15 x 30	26.50	11.75	11.00	15 x 32	29.50	13.75	12.50	15 x 34	31.00	15.00	14.00	15 x 36	32	32	32	16 x 16	11.00	5.10	4.85	16 x 18	11.90	5.50	5.15	16 x 20	12.25	5.70	5.40	16 x 22	14.75	6.25	5.95	16 x 24	15.00	6.50	6.10	16 x 26	17.50	7.20	6.25	17 x 30	21.00	11.50	11.00	17 x 32	23.50	9.95	9.90	17 x 34	26.50	12.00	11.50	17 x 36	28.00	13.00	12.50	18 x 18	18.50	7.20	6.60	18 x 21	20.00	7.75	6.80	18 x 24	21.50	8.00	7.00	18 x 27	27.50	10.75	8.85	18 x 30	31.25	12.95	9.60	18 x 33	38.00	15.50	12.00	18 x 36	38	38	38	20 x 20	19.00	7.35	6.85	20 x 22	21.60	7.95	7.40	20 x 24	22.00	8.20	7.50	20 x 26	23.50	9.00	7.90	20 x 28	30.00	11.50	9.75	20 x 30	33.50	13.00	11.90	20 x 32	37.50	14.50	12.50

12 x 16	5.60	3.00	3.00	12 x 21	24.50	9.50	8.40	12 x 25	28.00	9.75	8.60	12 x 29	29.00	10.00	8.80	12 x 33	41.00	19.00	14.50	12 x 37	49.00	21.75	15.50	12 x 39	54.00	25.00	16.50	12 x 22	28.50	9.75	8.00	12 x 24	29.50	9.90	8.80	12 x 26	31.00	11.75	9.80	12 x 28	34.00	12.75	10.60	12 x 30	36.00	13.90	10.90	12 x 32	42.00	16.80	13.00	12 x 34	47.50	17.80	14.00	12 x 36	52.00	21.90	15.00	12 x 40	64.00	28.00	18.50	12 x 23	28.50	9.75	8.00	12 x 27	33.50	12.60	10.20	12 x 29	38.00	14.10	11.60	12 x 31	42.50	17.00	13.10	12 x 33	50.00	19.00	15.50	12 x 35	67.50	28.50	20.00	12 x 37	74.00	24.00	20.00	12 x 39	8.80	8.80	8.80	15 x 24	30.00	10.00	8.80	15 x 26	33.50	12.60	10.20	15 x 28	34.00	12.75	10.60	15 x 30	38.00	14.10	11.60	15 x 32	42.50	17.00	13.10	15 x 34	50.00	19.00	15.50	15 x 36	67.50	28.50	20.00	15 x 38	77.50	31.00	22.50	15 x 40	95.00	39.00	32.00	15 x 42	80.00	32.50	23.50	15 x 44	105.00	44.00	31.00	15 x 46	112.00	46.00	34.00	15 x 48	132.00	54.00	40.00	15 x 50	100.00	43.00	32.00	15 x 52	112.00	50.00	36.00	15 x 54	120.00	50.00	36.00
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Registers, White Japanned.

List Sept. 2, 1901. Price each.

Size of opening.	Register face.	Wall frames.	Size of opening.	Register face.	Wall frames.	Size of opening.	Register face.	Wall frames.																																																																																																																																																																																																																																																																																																																																																																																														
4 1/2 x 6 1/2	1.70	.85	12 x 15	5.00	3.60	2.20	3.50	4 1/2 x 8	1.80	.90	12 x 16	6.70	4.10	2.40	3.60	4 x 10	1.90	1.05	12 x 17	7.60	4.75	2.50	3.80	4 x 12	2.15	1.30	12 x 18	8.15	5.00	2.60	3.90	4 x 13	2.35	1.45	12 x 19	8.60	5.40	2.65	4.00	4 x 15	3.50	1.70	12 x 20	10.80	6.20	2.70	4.20	4 x 18	4.90	2.10	12 x 21	14.70	7.60	3.00	4.70	4 x 24	7.00	3.25	12 x 23	24.00	11.20	3.50	5.50	5 x 8	9.50	4.25	12 x 24	30.00	14.50	4 1/2 x 10	1.85	1.20	.90	12 x 36	32.00	16.00	4.00	5.30	5 x 9	1.90	1.25	1.00	12 x 14	9.50	5.40	2.60	3.80	5 x 10	1.95	1.30	1.10	12 x 15	9.90	5.55	4.40	5 x 11	2.15	1.45	1.20	12 x 16	10.20	5.70	2.80	4.10	5 x 12	2.25	1.50	1.20	12 x 18	10.80	6.00	3.00	4.30	5 x 13	3.10	1.90	1.30	12 x 20	11.40	6.40	3.10	4.60	5 x 14	3.40	2.05	1.40	12 x 22	12.60	7.10	3.30	4.80	5 x 15	4.30	2.35	1.45	12 x 48	55.00	29.00	4.00	5.30	5 x 16	4.65	2.55	1.50	12 x 25	21.00	10.50	4.40	5.60	5 x 17	5.00	2.80	1.60	12 x 30	31.80	17.00	4.40	5 x 18	6.20	3.15	1.70	12 x 34	35.50	19.75	4.40	5 x 19	6.80	3.30	1.70	12 x 16	13.20	7.30	4.40	5 x 20	7.10	3.40	1.70	12 x 22	17.60	9.20	5.30	5 x 21	7.40	3.50	1.70	12 x 24	14.70	8.15	5.00	5.50	5 x 22	7.80	3.45	1.70	12 x 28	28.20	14.65	6.00	6.00	5 x 23	8.40	3.80	1.70	12 x 32	31.80	17.30	6.70	6.70	5 x 24	12.30	6.00	2.20	3.60	12 x 24	25.80	12.30	6.00	6.00	5 x 25	15.00	7.10	2.20	3.60	12 x 27	33.00	16.25	6.40	6.40	5 x 28	16.20	7.50	2.20	3.60	12 x 30	37.50	19.20	6.80	6.80	5 x 32	17.50	8.50	2.20	3.60	12 x 36	45.60	23.10	7.80	7.80	7 x 7	1.90	1.25	1.00	1.70	20 x 20	22.80	11.15	5.90	5.90	7 x 10	2.00	1.30	1.20	2.10	20 x 22	25.90	12.25	6.30	6.30	7 x 12	2.20	1.55	1.30	2.30	20 x 24	26.40	12.60	6.60	6.60	7 x 14	3.55	2.30	1.50	2.50	20 x 26	28.20	13.70	6.90	6.90	7 x 15	4.50	2.95	1.70	2.50	20 x 28	36.00	17.50	7.10	7.10	8 x 8	1.95	1.30	1.10	1.90	20 x 30	40.20	19.70	7.50	7.50	8 x 10	2.00	1.35	1.30	2.20	20 x 32	45.00	23.00	7.70	7.70	8 x 12	2.30	1.55	1.40	2.40	20 x 36	51.60	28.60	8.50	8.50	8 x 13	3.30	2.15	1.50	2.50	21 x 21	29.40	14.40	4.40	4.40	8 x 14	3.60	2.25	1.55	2.60	21 x 25	33.60	15.35	4.40	4.40	8 x 15	4.55	3.20	1.60	2.80	21 x 29	34.80	15.80	4.40	4.40	8 x 16	5.00	3.60	1.70	2.90	21 x 33	49.20	25.20	4.40	4.40	8 x 18	7.90	4.80	1.80	3.10	21 x 37	58.80	35.55	4.40	4.40	8 x 21	10.80	5.80	2.00	3.50	21 x 39	64.80	35.95	4.40	4.40	8 x 24	13.50

Extra heavy Black Japanned Faces are furnished at 50 per cent. advance upon the ordinary Faces. Black and White Japanned Ventilators for cords are 50 cents list extra on all sizes up to 14 x 14, and \$1 list extra on all sizes above.

Asbestos.—This commodity is in a somewhat anomalous condition, in that while the raw materials are higher than last year, contracts for which are in the main made for a year's supply, the manufactured products are somewhat lower. This is accounted for principally by the intense competition among manufacturer and distributor. The increased demand in the trade for the various forms of manufactured asbestos resulted in higher prices earlier in the season because the producers were not prepared to make adequate and prompt deliveries, but prices now in round lots to close buyers are about as follows: Building Felts, 2½ cents per pound; Mill Board, sheet, 40 x 40 inches, 3½ cents per pound; Mill Board, roll, thicker than 1-16 inch, 3½ cents per pound; Mill Board, roll, 1-16 inch and less, 2½ cents;

Oils.—*Linseed Oil.*—Another decline on September 5 brought quotations on City Raw in lots of five barrels or more to 50 cents per gallon, and in lots of less than five barrels to 51 cents. Out of town Raw is quoted at 45 to 50 cents per barrel, according to quantity. Since the decline outside Raw has been selling for October delivery in carload lots or more at 40 cents. The decline has stimulated a demand for less than carload lots and caused a stronger feeling in the market as supplies are being absorbed. It is understood that some crushers of outside Oil are now asking 50 cents in five barrel lots for immediate delivery, and that the amount of 45 cent Oil in like quantities is limited.

Spirits Turpentine.—Reports from the South are to the effect that the crop movement is becoming less and that stocks are light. The export movement of Turpentine may be checked as the result of a reported decline in price in London. Local prices are no higher than they were last week, which are as follows, according to quantity: Southerns, 36½ to 37 cents; machine made



Bommer Bros.' Pan-American Exhibit.

Rope and Wick Packing as low as 14 cents, although a fair range would be 15 to 18 cents, one of the largest companies selling more at the latter than former price. Some business has been accepted as low as 3½ cents for Mill Board in sheets thicker than 1-16 inch.

Glass.—A meeting of the National Window Glass Jobbers' Association was held at Detroit, Mich., last week with representatives of the Window Glass combines in attendance. Reports have been in circulation that an advance in price was made at the meeting. Such was not the case, and quotations remain unchanged. It is stated that the lack of demand did not justify an advance in price. Foreign negotiations are reported as proceeding favorably, with the object in view of the combine controlling the Belgian Window Glass output. Jobbers' quotations are as follows:

Discount.
Less than car lots, from store..... 80 and 20 %
Carloads, f.o.b. factory..... 85 and 5 %

Paints and Colors.—*Leads.*—No change has been made in the price of White Lead in Oil during the successive declines which have recently taken place in the prices of Linseed Oil. Some brands of Lead in Oil are irregular in price, but standard makes are held well up to quotations, which are as follows: In lots of 500 pounds or over, 6½ cents; in lots of less than 500 pounds, 7 cents per pound.

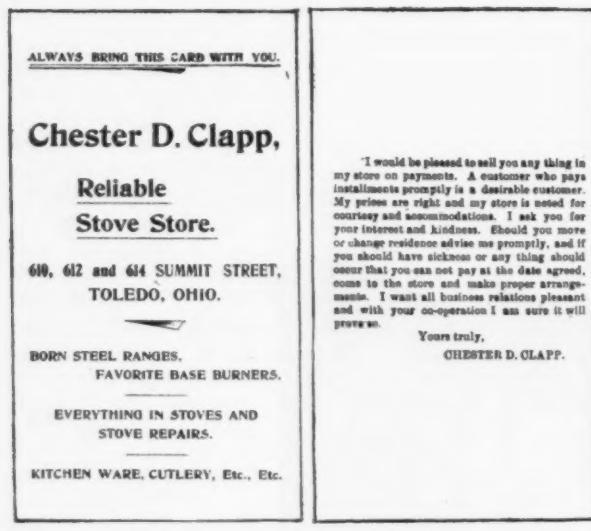
barrels, 37 to 37½ cents per gallon. Demand at this point is fair.

BOMMER BROS.' PAN-AMERICAN EXHIBIT.

THE exhibit of Bommer Brothers, 257-271 Classon avenue, Brooklyn, N. Y., is one of the best designed and richest of the Hardware exhibits, and shows their Spring Hinges and Ball Bearing Floor Hinges in all styles and finishes. The panels are set off by a carved mahogany fixture. There is one exceptionally heavy solid mahogany swinging door 4 feet wide by 8½ feet high and 3 inches thick hung on 12-inch solid bronze metal double action Hinges. Two double acting *café* doors are hung in place of the usual plate glass. There are also two mahogany vestibule doors, one swinging double action and the other single action upon bronze metal Bommer Ball Bearing Floor Hinges. These doors have single action *café* doors in place of panels. The ease and lightness of action of all these doors is especially noticeable. There are also some mounted floor Hinges conveniently placed for handling and examination, and also some regular Bommer Spring Hinges made to take apart, showing the interior steel construction and demonstrating why that easy motion is given to the door for which the Bommer Hinges have become well known.

CREDIT SALES AND COLLECTION OF ACCOUNTS.

MERCHANTS not infrequently look upon the credit part of their business as undesirable, if not an evil which they prefer to avoid. To desire and encourage such trade is unusual. Chester D. Clapp of Toledo, Ohio, looks at the matter in another light, and is doing a large credit business with satisfactory results. A considerable portion of the business is done on the installment or



Front Page.

Back Page.

Fig. 1.—Folding Card for Credit Sales.

easy payment plan. This plan covers Stoves, Washing Machines, Wringers, Tools, &c., and he has sold Christmas gifts on payments. Mr. Clapp expresses the opinion that the majority of all Stoves are now being sold in this way. The average furniture dealer is referred to as charging \$45 to \$50 for the same size and style of Range that the average Hardware and Stove-dealer sells for \$40, yet the furniture man makes the greatest number of sales.

The folding card, the front and back pages of which are shown in Fig. 1, reduced in size, has been found con-

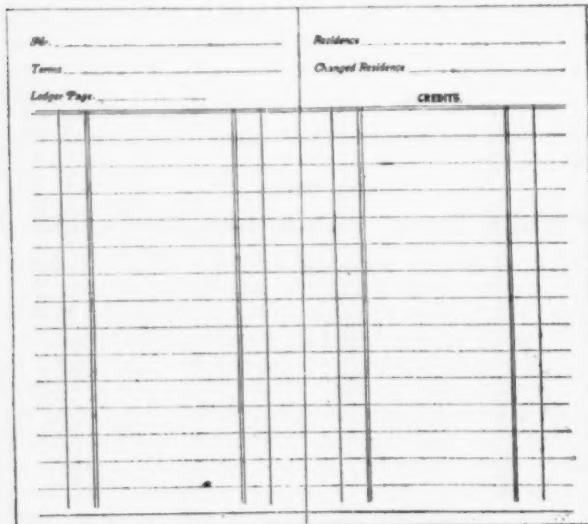


Fig. 2.—Inside Pages of Folding Card. Actual Size 6 1/4 x 5 1/2 Inches.

venient and practical to use when merchandise of any kind is sold on payments or credit. It is 6 1/4 inches wide by 5 1/2 inches long, printed on good stiff manila paper, made to fold in the center. The printed matter on the back cover is in a courteous form, to convey to the credit customer the idea that his trade is not only sought after, but that it is valued as much as that of cash customers.

The inside pages, reduced in size in Fig. 2, are arranged with the proper spaces for entering the goods sold, and the credits as payments are made. The customer retains this card. It has been found that the card answers its purpose much better than the ordinary bill or statement of account; that it will stand more wear and tear; that it gives a better opportunity to display advertising matter conspicuously; that the notice regarding payments is read and complied with more readily than the abrupt demand written in red ink, which usually appears on the statement of account, and that it tends to make customers more frank in their dealings with the merchant.

The Tickler, illustrated in Fig. 3, reduced in size, is used in connection with the sale of goods on payments, or in the collection of delinquent accounts. This card is made of somewhat heavier manila stock than the one shown in Fig. 1. It is 3 3/4 inches wide by 8 1/2 inches long. In connection with the Ticklers a cabinet is used, having 31 compartments, each compartment representing a day of the month. Each Tickler used contains a full statement of a customer's account, posted up promptly as payments are made. Each Tickler is placed in the compartment representing the day of the month when payment is promised or expected, and moved from one date to another as necessity requires. For instance, the Tickler of a customer who pays promptly on the 10th of each month is never disturbed; but, if tardy, and he promises

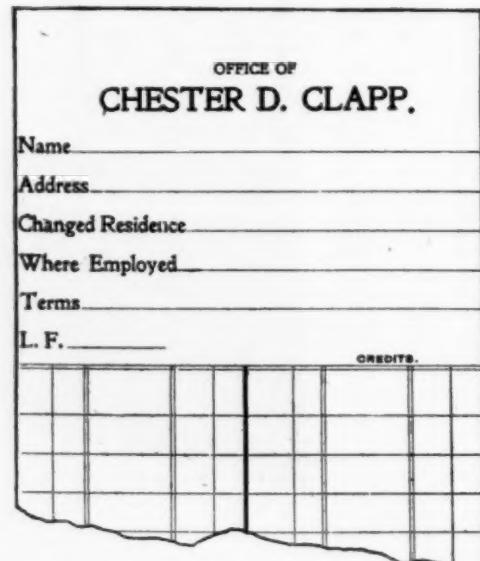


Fig. 3.—Tickler. Actual Size 3 3/4 x 8 1/2 Inches.

to pay on the 20th or 25th, his Tickler is moved forward to that date. If wholly delinquent, the Tickler is taken from the cabinet and is kept with others for prompt adjustment in some way. The collector takes the Ticklers when making his calls for payment, a record being kept at the office of any Ticklers taken away for such purpose. The ledger account is kept up as well as the cards. Among the advantages of the system are the following: That the system is simple; that it saves making out so many statements; that promises made the merchant are before him each day, and that the Tickler containing the entire account is portable and can be changed from cabinet to desk, given to collector, &c., with greater facility than memoranda.

Mr. Clapp advises merchants to pay less attention to selling Wire, Nails, Poultry Netting, also to soliciting contractors' and manufacturers' trade, and cultivate the profitable household trade with the same weapons that are being used by merchants in other lines. He remarks that the average John marries his Emma with \$100 to his account in the bank, and needs \$200 to \$300 worth of goods to begin housekeeping. He adds, such accounts are seldom found to be delinquent, but are paid as agreed upon, and more goods bought. The opinion is expressed that this system of doing business will pay, no matter how small the town.

Notes on Foreign Trade

BRITISH LETTER.

Office of *The Iron Age*, HASTINGS HOUSE,
NORFOLK ST., LONDON, W. C., August 30, 1901.

Metal Goods in Egypt.

WITH reference to the extent of the trade in manufactured metals done with Egypt your readers will be interested in seeing the relative proportions supplied by the various countries interested:

Year.	Total.	United Kingdom.		United States.		Austria-Hungary.		Belgium.		France and Algiers.	
		£E.	£E.	£E.	£E.	£E.	£E.	£E.	£E.	£E.	£E.
1895 . . .	356,845	293,903	69,845	475	18,539	239,867	189,461				
1896 . . .	1,122,203	382,853	96,636	343	16,768	333,869	238,550				
1897 . . .	1,128,875	462,732	81,861	10,449	23,478	342,055	138,404				
1898 . . .	1,423,760	747,975	70,884	4,688	27,988	383,841	102,724				
1899 . . .	1,607,607	769,686	102,599	52,177	24,113	460,215	127,904				
1900 . . .	1,817,970	1,077,810	144,402	40,008	35,603	309,840	143,767				

I have given in the above table the extent of the trade done by the six largest countries, but it must also be remembered that a much smaller trade is done in these goods with Egypt by Greece, Italy, Russia, Turkey and other countries. These large increases in total trade are mainly due to the extension of tramways and of State and light railway systems, together with large additions made to the rolling stock of the State railways and the dam works now being carried out by English contractors at Assouan and Assiout. While these figures refer to the heavier metal goods, there is a growing and healthy demand for light Hardware, Lamps and Electrical Apparatus. There seems to be no reason why America should not compete in many of these goods, bearing in mind the easy sea transit between the eastern seaboard of America and the ports of Egypt. A glance at the figures for the United States will show that trade can be done if it is consistently and not capriciously followed up. I may add that the figures are set forth in Egyptian pounds. As things are now England still does the bulk of the Egyptian foreign trade, but there is no reason why this should continue indefinitely.

Trade with the Philippines.

The recent articles appearing in *The Iron Age* upon the prospects of trade in the Philippine Islands have been noticed over here and commented upon in the trade journals. In my half yearly report on the trade of Great Britain I have pointed out how that, notwithstanding the American occupation, the British trade in Galvanized Goods with the Philippine Islands had largely increased. It is perhaps as well to remember that British interests in the Philippines are much larger than is generally supposed. There are about 20 British firms in Manila, many of them of long standing, and two of the three banking establishments in the city are branches of British houses. They include the largest import and export firms, while engineering works, ship repairing, stevedoring and other industries are represented. The larger firms have branches in most of the provincial ports. The railway from Manila to Dagupan is the property of a British company. For those who are thinking of settling in the Philippine Islands it is worth knowing that living expenses have been more than doubled within the last two years, and house rent is even yet high.

Drummers Can Do It.

In a very valuable and complete trade report upon prospects in Norway special emphasis is laid upon the importance of sending out commercial travelers. During the past year the number of commercial travelers who have visited Christiania and presumably other ports of Norway were 879 German, 118 British and 30 Austro-Hungarians. The report says, regarding a disposition to think the trade of Norway small potatoes, that as a matter of fact good business can be done if only it is properly cultivated. The small trade done with Switzerland is generally attributed to the fact that England does not send commercial travelers there. The British trade with Switzerland is relatively chosen ground in every

direction. Last year, against 3828 travelers from Germany and 1176 from France, there were only 28 from Great Britain. That trade can be done with Norway is undoubtedly. I see, for example, that in the district of Stavanger last year there was imported 70½ tons of Hardware, 46½ tons of Tools and Implements, 83 tons of Sheet Zinc, 882 tons of Pig Iron, 130 tons of Steel, 400 tons of Brass and Hoop Iron, 182 tons of Tin Plates and Iron Sheets, 300 tons of Wire, 40 tons of Anchors, 223½ tons of Iron Pipes and 131 tons of Axles, Rails, &c. Practically nothing of this trade apparently is done by the United States. There is no apparent reason why, if the United States commercial representative were to visit this district, he might not get his share of it. This is not an isolated instance, as I notice that in the district of Arendal the following goods were imported during the year 1900: One hundred and forty-five tons of Anchors and Chains, 245 tons of Iron Plates and Bars, 130 tons of Iron and Clay Tubes, 1740 tons of Steel Plates, Bars, Angles and Bolts, 160 tons of Rivets, 150 tons of Pig Iron and \$11,500 worth of machinery. The full extent of the trade done by the United States with Norway may be set down at \$5,300,000. Of this amount \$500 may be set down to raw and half worked metals, \$150,000 to metal goods and \$335,000 of vehicles and machinery. It is too often the custom for traveiers to regard Sweden as being the really valuable center and to overlook the fact that there is a very steady and regular trade to be done with Norway. Further, if the trade is once obtained it can be held.

No Preference.

The Colonial Secretary has recently announced that in the Transvaal and the Orange Free State there is to be no fiscal preference to British traders. This is exactly as any one would have expected, but strong efforts are being made to bring pressure to bear upon official circles to declare a preferential rate for British goods into these two new colonies. An influential member of Parliament has put down notice to move in Parliament that it is desirable to give manufacturers of the United Kingdom who are paying for the settlement opportunities for trade superior to those offered to the manufacturers of foreign countries—that is, competitors who have not paid. There is no likelihood that this motion will receive the slightest consideration from the Government.

Business Is Better.

Business is now brisking up after the holidays. There is a more cheerful feeling in the Midlands, particularly as many Midland manufacturers think that the war is nearly over. The proposed new German tariff turns out to be more unfavorable to manufactured British products than was at first supposed. While it is true that no increase is proposed on Pig Iron or Railway Axles and that coal and other raw materials will continue to be admitted duty free, it is of course recognized that these concessions are in the interests of German manufacturers, but nearly all finished or half finished products, including Bar Iron, Sheets, Wire, Steel and Iron Castings, Iron Pipes, Steam Engines, Saws, Tools, Dynamos and Machinery generally are in effect subject to advances ranging from 50 to 100 per cent. On the other hand it is expected that the new tariff will become law in its present form, but even if the duties proposed should be materially reduced they will even then be heavy enough to extinguish many branches of British trade with Germany. The last mails have brought some large orders for Hardware from India and Canada, as well as from Australia and South Africa. The orders are mostly for Iron and Steel, Galvanized Sheets, Wrought Iron Tubes, Fencing Wire, Carriage Iron Work, Agricultural Tools and General Brass Foundry. At home there has been some revival in the brass working trades, the makers of Fenders, Curbs and Fire Brasses being at the present moment busy. At this time of the year the trade in chandeliers and fittings shows some improvement, while the electric lighting branch is active. The Sheffield trade continues in a very depressed condition, and there is considerable uncertainty as to the fu-

ture. The next two or three months should be carefully watched, as they will probably indicate what is to be the trend of trade next year.

AUSTRALIAN NOTES.

FROM OUR SPECIAL CORRESPONDENT.

MELBOURNE, August 12, 1901.

Hardware business has of late been very quiet. Delay in the introduction of the tariff bill is largely responsible for this, although the slackness is in some part due to the particular season of the year, for both wholesale and retail trade usually find a falling off during the months of July and the early part of August, practically the worst of our winter.

Federal Tariff Bill.

The Federal Tariff bill itself has been an accomplished fact for some weeks past, but the contents of it are only known to two members of the Ministry, the treasurer, Sir George Turner, and the Minister of Customs, Mr. Kingston. It is possible that Parliament will be asked to adjourn for a fortnight to enable the Ministers to give their undivided attention in Cabinet to tariff matters.

Dutiable Goods Being Bonded.

Meantime dutiable goods are being largely bonded in anticipation of the possibility of reduced duties, while duty free goods are being stocked against the possibility of a duty being imposed. Both town and country retailers are keenly alive to the position and ordering goods accordingly. Prices in food supply are ruling higher than usual this winter, and this is acting as an additional check on retail, and, as a natural consequence, on wholesale trade.

Local Factory Act in Operation.

The working of the local Factory act, a new scheme of protection for the workingman, is causing intense dissatisfaction among certain sections of manufacturers by "regulating" wages, hours, boy labor, apprentices, &c., to such an extent as to practically prohibit, in many lines, the possibility of competing with outside countries.

AN IRON FOUNDERS' EXPERIENCE.—A local iron founder, who recently returned from an extended trip through England and America, working his way as a journeyman in order to gain an insight of English and American methods was so impressed with his trip—the amount of machine labor as against hand labor in use, wages, conditions of living, facilities for transport, &c., as to be at present seriously considering the advisability of transferring his capital to your side.

IMPORTING SMALL CASTINGS.—Again, one of the largest manufacturers of harvesting machinery in Australia, Hugh McKay, employing some 150 hands at his works in Ballarat, is making preparations for the indenting of the lighter parts (hitherto locally made) from America and England. Here, of course, is a chance for American makers to creep in, and under present conditions small castings will figure more largely in future in the list of imports than has been the case in the past.

AMENDING THE ACT.—An amended act will shortly have to be introduced, as manufacturers in every branch of trade are turning away hands.

Reciprocity.

Much ink has been expended of late in the columns of *The Iron Age*, on the subject of commercial reciprocity, and the question, in the near future, must be one of moment to the States of Australasia. Especially so with regard to trade relations between America and this part of the world. A little jealousy still exists, and is carefully nourished by the "ultra British" section of the community, averse to trade relations with your country.

It is pointed out that it is to the fostering care of England that Australia owes her position and her development to-day, that she takes the bulk of our produce, and in return for her many valuable concessions our national policy should be to support her to the exclusion of other nations.

Now what commercial concessions is America pre-

pared to extend to us? She takes little from us now, except in gold, and the time is at hand when by yielding more she can gain more. The opportunity will be forced upon her from without—and by Argentina. Our wool and frozen mutton are being elbowed out of the English market in favor of the Argentine product. This is a blow at the foundations of Australian prosperity, and unless we get preferential terms our English market will surely slip away.

America is a large manufacturer of wool, and it is certain she does not grow all her own, and equally certain she takes little from us. Could she not take more? She will have to reciprocate in some greater degree at present if she wishes to silence those who, with some small apparent show of justice, now cavil at her methods.

American Goods in the Australian Market.

American goods continue to bid for the Australian market, but it is a curious fact that the trade latterly is not more than holding its own. It is certainly not increasing to any noticeable extent. Possibly the restricted trade all around of the past few months may in some manner account for this through not opening fresh channels, &c.

BAR IRON.—Your Bar Iron of late has caused profanity, not in Australia alone, but, judging from the papers throughout the world, owing to its lack of uniformity of quality.

AMERICAN AGENTS.—American agents here are not hustling so keenly for trade as hitherto, possibly awaiting tariff developments. Your correspondent has previously told you, and again repeats it, that there is still room here for a few energetic men to hustle round in such lines as mining requirements, mill furnishings, light gardening tools, bedsteads, hollow ware (being steadily grabbed by the Germans), tubes for steam, water or artesian use, &c.

CUTLERY.—American Cutlery is scarcely known, while the Fatherland is scoring heavily.

RANGES, STOVES, &c.—American Ranges, Stoves, Grills, &c., are losing ground, and brassfoundry is being crushed out by the British.

PLUMBING Goods.—In Baths and Sanitary Fittings you are gaining a hold, but your efforts are spasmodic instead of persistent.

Exchange.

A question has arisen in the daily press as to what rate of exchange shall merchandise shipped from America to Australia be settled at in cases where the exchange is left open, the bill, drawn in dollars, not having been negotiated in the sterling rate of exchange of the day.

The decision given is that the settlement should be effected at the rate of the day without attempting any advantage, but should the case be determinable by United States law concerning the par of exchange, then payment would have to be made at the rate of \$4.8665 to the £.

When the bill is not indorsed at the current rate, however, such rate should surely hold good, proof of the actual currency being forthcoming.

Conference of Master Plumbers and Sanitary Engineers.

The Interstate Conference of Master Plumbers and Sanitary Engineers is being held in Sydney. A draft constitution and by-laws have been adopted. Several resolutions dealing with the question of materials and contracts have been discussed in committee, and the association's labors may be said to have begun. The name, we believe, is to be the National Association of Master Plumbers of Australasia, and its aims and objects will be largely those of the American Association of Plumbers.

Decimal Coinage.

An attempt is being made to introduce the decimal system of coinage in Australia, and witnesses are being examined before a select committee of the House of Representatives.

The outlook for the adoption of the system is not particularly hopeful. You can easier despoil the aver-

age Briton of his socks than of his belief in the infallibility of his currency system.

A Generous Employer.

S. Hordern, the proprietor of Anthony Hordern & Sons, whose huge Hardware and general store in Sydney was burnt out a few weeks ago, as advised in my last letter, has offered to pay to the widow of Dashwood, the engineer, and the only married employee who lost his life at the fire, the sum of £2 per week for five years and to teach each of her five children a branch of his business and find employment for them at the emporium.

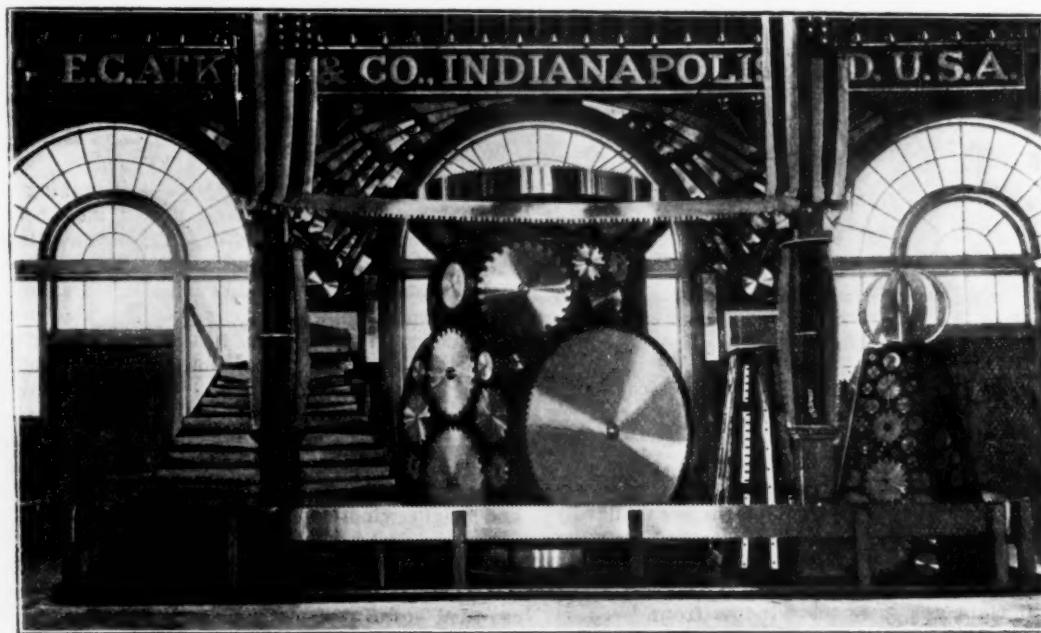
The firm, who have for years past employed nearly 2000 hands, and indirectly have given employment locally to a couple of thousand more, are still located at the Exhibition Building pending the rebuilding of their premises.

LARGE SHIPMENTS OF GAS STOVES, WASHING MACHINES, Etc.

A. Van Der Laan & Co., 18 Broadway, New York, importers and exporters, are the branch of a house in Rotterdam and Amsterdam, Holland, who export gen-

E. C. ATKINS & CO.'S BUFFALO EXHIBIT

E. C. ATKINS & CO. of Indianapolis, Ind., have one of the most conspicuous displays in the Machinery Building at the Pan-American Exposition. The space is directly opposite the south entrance of the building, and the wall decorations are on such a large scale that they can be seen from any point on the south side of the building. The size of the exhibit is 30 feet in length by 15 feet in depth. The railing surrounding this space is characteristic of the exhibit, as a 14-inch Double Cutting Band Saw is used for the purpose, being attached to ornamental posts. The center of the space is occupied by a large drum kept continually revolving. This drum is 14 feet high and 9 feet in diameter, and on it are 160 Circular Saws varying from 3 to 88 inches in diameter. The 88-inch Saw is stated to be the largest Circular Saw ever put to practical use in cutting timber. This saw is made of No. 12 gauge sheet steel. The exhibit on the drum is surmounted by a 12-inch Band Saw in the form of a crown. This drum is placed between two pyramids. On one of these pyramids is a large line of Machine Knives, and on the other is shown a complete line of such small goods as Hand Saws, Butchers' Saws, &c. Along one side of the space is a



E. C. Atkins & Co.'s Buffalo Exhibit.

eral lines of American manufactured products as well as foodstuffs, &c. Their business is mainly confined to Holland and Belgium. They recently placed with the Criterion Mfg. Company, 443 Greenwich street, New York, what they believe to be the largest export order for Gas Stoves so far given in this country from continental Europe. During August 575 Gas Stoves were shipped, one lot of 102 cases going August 24 by the "Euxinia," and early in September another order for 980 Gas Stoves was placed with the same concern, the last lot measuring about 200 tons, shipment of which has been arranged by the Phoenix Line steamer sailing September 21. A recent shipment of 600 Washing Machines was made in one lot, and since the beginning of the current year, so far, 6000 have been sent forward. They have also forwarded direct to France recently 15 cases of Stoves and Radiators. The business of the New York house is entirely with the main houses in Holland.

COATES CLIPPER MFG. COMPANY, Worcester, Mass., have just made John H. Graham & Co., 113 Chambers street, New York, their sole selling agents for their entire output of Horse and Barbers' Clippers.

H. R. Shields has purchased the general Hardware business of Cady & Ralls, Osgood, Mo.

large showcase containing complete sets of Saw Tools and small articles. The wall space is covered with Hand Saws of all descriptions, and above them is an electrically illuminated sign nearly 50 feet in length. Above this sign, reaching to the roof, are three large paintings illustrating forestry. The exhibit is in charge of Edward H. Taylor, who also had charge of the company's exhibit at Paris, and the entire arrangement and design are his conception.

MILLERS FALLS COMPANY'S NEW CATALOGUE.

MILLERS FALLS COMPANY, Millers Falls, Mass., and 28 Warren street, New York, have just issued catalogue No. 27 of their fine Mechanics' Tools. The following goods are new since the last catalogue published, some of them being entirely new to the trade while others having been put out at intervals since catalogue 26 was issued. One article is a corner Ratchet Borer for plumbers, electricians, &c.; another Breast Drill No. 18, together with the Universal Hand Drill Press, Millers Falls Chain Drill, Handy Screw Driver, Extension Steel Frame Hack Saw, Star Chucks and the Star Miter Box. The remaining 78 pages illustrate a variety of standard fine Tools for working wood and metals.

SHOW WINDOW DISPLAY.

The trade are invited to contribute information in regard to methods which have proved satisfactory, with descriptions of attractive displays. Inquiries also are solicited, to which careful attention will be given.

HARDWARE STORE WINDOW DISPLAY.

BY L. J. A. SURVEYER.

PART III.

Use of Mirrors in Fixtures.

The use of mirrors in the show window is not as general as it deserves to be. They serve to make many displays more attractive, frequently adding much to the effect. Fig. 11 illustrates long, narrow mirrors used

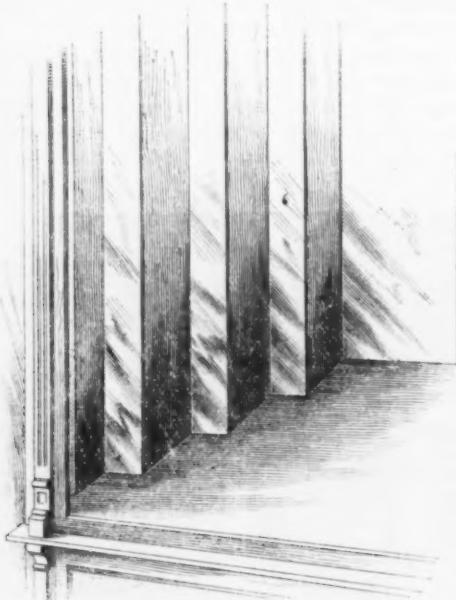


Fig. 11.—Showing Narrow Mirror Glass Panels for Sides and Back of Windows.

in dressing the sides of a show window. The effect produced by goods shown in front of these can hardly be realized. On the narrow spaces are tacked strips of mirror glass; these may be placed parallel or diagonal to the window front. The wider spaces for displaying goods are at right angles to the window front. These large spaces should be covered with cardboard, on which are tacked or sewn Tools, such as Bits, Chisels, Brass Hardware, Cabinet Locks, &c. This design may be modified according to shape of the show window.

Stands made of wood with mirror glass inside can be used to good advantage for center of window. The

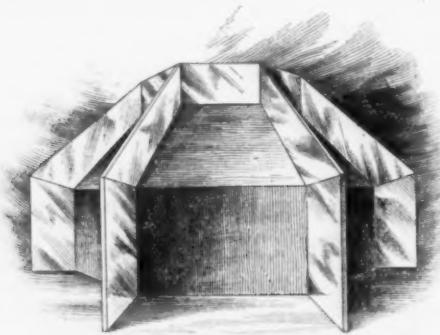


Fig. 12.—Stand with Mirror Glasses.

one shown in Fig. 12 will triple the articles displayed on it. A stand of this kind is particularly valuable for displaying goods of which but a small stock is carried.

Fig. 13 shows a cabinet made of wood. The floor, sides and back are covered with mirror glass, and on top is placed a pyramid of steps for showing goods. The writer has used this for displaying Cabinet Hardware, fine Tools and other small articles kept in a Hardware

store. It has been found that goods shown in this manner have attracted attention and sold well.

The Lighting of Windows.

Electricity is preferable to gas or any patent light for the show window. It has every advantage over the others. There is less danger of fire; it does not heat the window like gas or oil, and it can be turned on or off from the store, not having to open the window every

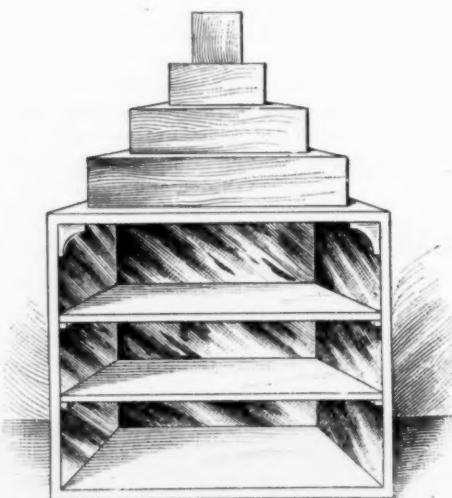


Fig. 13.—Cabinet with Mirrored Sides and Back.

time in the winter and run the risk of making the glass frosty. Electric light can be placed anywhere in the window to suit any special display, such as illuminating signs.

For general show windows the lights should be put at the top, near the glass, covered with a reflector made of polished tin to increase the light and give it the projection required. On a busy street, a well dressed window, if lighted till 12 at night, will prove to be a good advertisement. People passing along the street coming back from the theaters, social gatherings, churches, &c., will always linger a moment to pay a tributary glance of admiration to an elegant, artistic and bright window. Merchants should not try to economize on light. The show window should be kept bright even if trade is dull, because it gives the idea of prosperity, it is businesslike, and the evidence of a crowded store. When business is stagnant don't be inactive; if nothing turns up, turn something up.

Colors for Background, Bottom and Sides of Windows.

In selecting colors for covering platforms, steps, shelves, &c., for window dressing, dark colors are preferable, and three at the most should be used. For displaying Cutlery, such as Razors, Penknives and Scissors, black and green felt should be used, and make an effective combination. Other colors that harmonize well together are green and violet. Blue and yellow are agreeable to the eye; yellow and indigo accord well, green and yellow produce a lively appearance. Black is a favorite color for a general display and makes a pretty contrast for almost any other shade. When experimenting in colors, if one finds that they do not harmonize well he should separate them with white; it will always produce a better effect.

How to Clean Plate Glass.

There are generally two ways of doing everything—the right and the wrong way. Some people take a great deal of time and trouble in cleaning windows, using soap, chemicals, linen cloths, &c. The best way for cleaning plate glass is to take a bucket of water and two chamois leathers. This is all that is necessary to secure good results—a bright window. It is effected in less time and also with less fatigue than in any other way. Before touching the glass, the inside of the window should be thoroughly dusted and cleaned. A dull day is preferable for window cleaning, and no attempt should ever be made to wash the glass when the sun

is shining on the window, for, no matter what pains are taken and time spent, it will dry streaked and will not be bright.

How to Prevent Frost on Glass.

In a climate like that of Canada and some of the New England States, merchants are often troubled during the winter, and generally about Christmas and New Year, with a frosty glass, if means are not taken to prevent it. The writer has had a little of that trouble and finally found a solution. An old experienced contractor called at the store and, after having explained the trouble to him, he answered, "Bore holes at the bottom of the window." This was done, but it did not remedy the matter. Another man was sent for. He said, "Air should be let in at the top." Holes were made again, with no better results. At last, deciding to try to discover the trouble, the writer closed the back of the window tightly, applying weather strips to large joints, then loosened the outside molding holding the plate glass. The result was a success—a glass dust proof and free from frost all winter.

When a window has no back partition the best thing

is cut in a semicircle. When adjusted together they leave an O shape to let light in the store. On these boards are displayed Brass and Fancy Cabinet Hardware. All platforms, shelves, &c., are covered with black cloth, except the middle ledges in front, which are covered with green felt.

How the Writer Dresses His Window.

The writer has but one window. It is a large one, being about 12 feet wide by 6 feet deep. He generally chooses a dull day and dresses it early in the morning, or after 7 p.m. To begin, he selects the goods to be displayed, then cleans and polishes them and puts them aside with the platforms, stands, &c., that are going to be used. Then he takes goods out of the window and puts them where they will not be in the way. Next the inside of the window is cleaned and dusted, and the plate glass cleaned. It generally takes three or four hours to make a good display of some special lines or of general goods, if not disturbed in the operation.

Goods put in the window can be taken out at any time if one happens to run short of stock. Sometimes goods taken out of the window are put back again, dis-

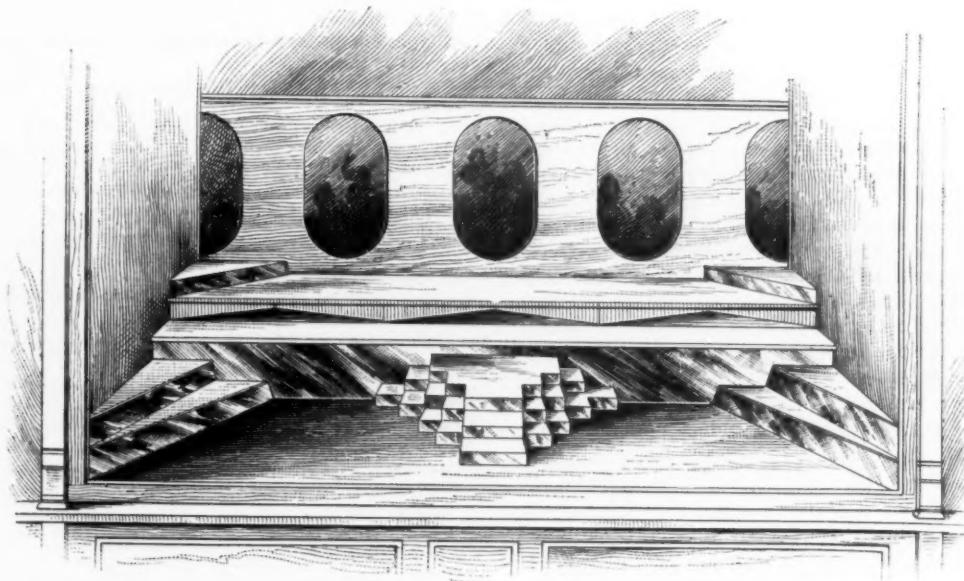


Fig. 14.—Window Ready to Receive Goods.

to do to prevent having a frosty window is to get another plate glass fixed close to the first, say with about an inch space between. If this is done properly the window will never freeze even in the coldest of weather. It has been tried here and has been found to be a success. The additional plate glass is generally rented from dealers in that line of goods, for a few dollars, put in by them in the fall, and taken away in the spring. Another effective and cheap way of preventing frost on a window during winter is to rub it with alcohol or glycerine two or three times a week.

Description of the Writer's Show Window.

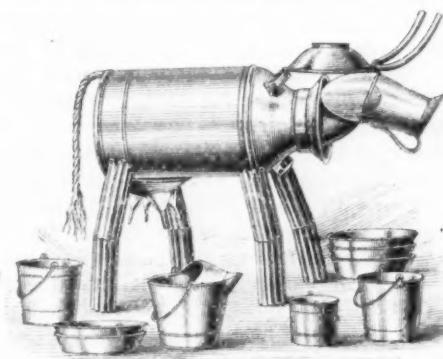
The writer's window, as shown in Fig. 14, has a false bottom flush with the plate glass covering the whole breadth and half the depth of the window. This bottom is raised 6 inches at the back. Behind the filling in the rear bottom part of the window is a platform 10 inches above false bottom. Above this platform is a shelf a little narrower, with a zigzag front, about 6 inches high and same length as under platform. On each side of false bottom are two ledges, one smaller than the other, and forming an angle of 45 degrees. In the middle are also three more ledges, one on top of the other, each being 2 inches high.

The fronts of all platforms, ledges, shelves, &c., are covered with mirror glass, which makes the window bright and gives the display the appearance of double its size. A mirror placed in front of zigzag platform has also a very pretty effect. The background of the window is covered with four boards, each side of which

is played in a different manner. Seasonable articles are ticketed as to their utility, and their prices are marked on a neat card.

THE TIN COW.

A unique dairy supply display was made in the shape of a Tinware cow and exhibited by Frank B. Merrill, Allison, Iowa. As seen in the illustration, the body of



The Tin Cow.

the cow is made of a Milk Can, being supported on legs of Corrugated Pipe. The head is composed of a Tin Pitcher and a Basin, while the horns are formed of Bicycle Handle Bars. A Rope constitutes the tail, and the

construction of other parts can be seen from picture. To complete the exhibit, Pans, Pails, Churns, Butter Bowls, &c., were placed around the cow.

This display attracted more than its share of attention. This was partly due to the fact that an illustration of the cow was used in Mr. Merrill's advertisements in the local papers, thus giving it wider publicity than is usually accorded to Bossy.

TRADE ITEMS.

BIGELOW & DOWSE COMPANY, Boston, have been appointed New England agents to the Hardware trade for the Loxit Sash Balance, made by International Lock Company, Providence, R. I., and will carry a complete stock. The manufacturers state that the Loxit costs no more than the ordinary method of hanging windows, is entirely concealed from view and is easily applied to old as well as new houses. It is referred to as an automatic window Lock in every sense and as absolutely burglar proof. It is offered in Style A, which form is encased in three sizes of seven varying strengths, designed to carry window sash from 4 to 26 pounds, and in Style C, which is encased in four sizes of 21 varying strengths, designed to carry window sash from 4 to 80 pounds.

WATERBURY BRASS COMPANY, Waterbury, Conn., advise us that business in their new store at Providence, R. I., has been constantly increasing since they took possession some months since, and they are now carrying a larger stock in all lines than ever before. The company have had a store in Providence for many years, but business increased to such an extent that they were compelled to seek more commodious quarters, which were secured at 131 Dorrance street and 152 Eddy street, where they have what is perhaps the finest store of its kind in this section of the country. Much of the prosperity of the company in the territory covered by the Providence store, which includes Rhode Island and Southeastern Massachusetts, is attributed to the efficient work of P. F. Parsons, who has managed this branch for nearly 20 years.

DILLE & MCGUIRE MFG. COMPANY, Richmond, Ind., manufacturers of Lawn Mowers and Lawn Trimmers, have recently appointed H. H. Lyon, 309 Broadway, New York, to represent them in territory east of the Alleghany Mountains. Mr. Lyon will carry a stock of the goods in this city for the accommodation of the trade. For a period of about 12 years he has represented the Blair Mfg. Company, Springfield, Mass., who also manufacture Lawn Mowers.

BRODERICK & BASCOM ROPE COMPANY, St. Louis, Mo., manufacturers of Wire Rope and Cordage, are distributing an embossed leather souvenir match safe with flap and recessed strike, the latter protected by leather.

HENRY NEWALD, manager of the United States Export Association's branch office in Berlin, Germany, has arranged to extend his offices on a larger scale in September of this year. It is proposed to keep the catalogues of such American firms on file as desire European connections, the American manufacturing concerns sending to the above address catalogues with information in regard to prices, &c., for the use of buyers in the different European countries.

CHARLES G. DENNISON of C. Sidney Shepard & Co., Chicago, has returned from a two weeks' trip, during which he visited all the Western branch houses of the firm, including those on the Pacific Coast. Mr. Dennison reports the prospects for business throughout the territory very encouraging. The Pacific Slope especially has been favored with splendid crops, and that part of the country will require heavy supplies of all classes of merchandise.

M. R. O'NEILL, wholesale and retail dealer in Hardware, Stoves, &c., Fargo, N. D., has opened a branch store at Sisseton, S. D., under the firm name of O'Neill & Gilmer, with Mr. Gilmer as resident manager. They will carry a complete line of Hardware and Furniture and would be pleased to receive catalogues, &c.

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SOUTHERN HARDWARE JOBBERS' ASSOCIATION.

Southern Hardware Jobbers' Association have just issued a little pamphlet concerning the *personnel* of the association. It gives the officers and members of the executive and standing committees for the ensuing year, and also the membership of the organization comprised in the States of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas and Virginia and District of Columbia and Indian Territory.

TURNER, DAY & WOOLWORTH HANDLE COMPANY CHANGES.

TURNER, DAY & WOOLWORTH HANDLE COMPANY, Louisville, Ky., have made several changes in the conduct of their business, one of which is the removal of their New York branch from 100 Chambers street to 116 Broad street, from which source will be conducted such transactions as properly belong to Eastern territory and the export trade. It will be remembered that the present company under new management, as reorganized in July last, to which reference has been made in these columns, includes the business of Turner, Day & Woolworth Mfg. Company, Louisville, Ky.; American Handle Company, Knoxville, Tenn.; Hartzell Handle Company, Huntington, W. Va.; Standard Handle Company, Knoxville, Tenn.; Harrisburg Handle Company, Bristol, Tenn.; Nashville Spoke & Handle Company, Nashville, Tenn., and a number of other smaller factories. W. R. McCullough, who for many years was the Eastern representative of the Turner, Day & Woolworth Mfg. Company, has gone into other business and has been succeeded by H. M. Morrison, who will in the future manage the Eastern branch. Mr. Morrison has been connected with the Turner, Day & Woolworth Mfg. Company for 15 years, a considerable portion of which has been spent calling on the trade from the East to the Pacific Coast and intermediate points, with headquarters at Louisville. Particular attention will be given to marketing this comprehensive and complete product abroad, although a large quantity of these goods has long been exported.

PRICE-LISTS, CIRCULARS, &c.

RUSSELL & ERWIN MFG. COMPANY, New Britain, Conn., and 43-47 Chambers street, New York: Twelve page illustrated booklet of Century Ornamented Rim Locks in several shapes. In the front is a historical sketch and reproduction of the Emigrant Lock, pioneer of its kind.

ATLAS SHEAR COMPANY, Bridgeport, Conn.: Catalogue representing their line of Cast Shears and Scissors of every description for domestic and export trade.

NATIONAL VISE & TOOL WORKS, Camden, N. J., for whom Tower & Lyon, 95 Chambers street, New York, are the general sales agents, controlling the entire product, have just issued an illustrated catalogue of Snediker's Quick Acting Leg Vises, Snediker's X L Rapid Bench Vises and Stephens' Quick Adjusting Bench Vises, the last of which have been on the market nearly a half century.

THE KILBORN & BISHOP COMPANY, New Haven, Conn.: The company have issued their first catalogue of Drop Forgings and Forged Hardware. It does not represent all their manufactures, as they are making some goods which are put on the market by other parties. Among the goods represented in it are Combination Pliers, Whiting and Woodman Saw Sets, Champion Gauges and Cold and Cape Chisels. The company state that they have excellent facilities for making up to date special Drop Forgings from steel, copper, iron, &c., and for annealing and case hardening.

STUDEBAKER BROS. MFG. COMPANY, South Bend, Ind.: "In Six Wars," is the title of an elegantly printed pamphlet in which attention is called to the Studebaker Vehicle as a factor in modern war.

BROWN & SHARPE MFG. COMPANY, Providence, R. I.: Illustrated booklet entitled "Something New," describing new lines of Spring Nut Dividers and Outside and Inside Calipers of new design, together with a line of Firm Point Outside and Inside Calipers.

OTWAG COOPER, Urbana, Ohio: Catalogue of the Rope Horse Goods of which he is manufacturer. It is accompanied by a sheet giving net prices.

BRIGHT & CO., Reading, Pottsville and Hazleton, Pa.: Catalogue of 80 pages devoted to their line of Sporting Goods.

AMONG THE HARDWARE TRADE.

Davis & McLaughlin have succeeded A. L. Davis & Son in the Hardware, Agricultural Implement and Sporting Goods business in Cozad, Neb.

Scott & Bobb have lately engaged in the Hardware, Stove and Plumbing business at 812 North Kansas avenue, Topeka, Kan.

A recent fire slightly damaged the store of Smith & Becker, Camden, N. Y., wholesale and retail dealers in Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, Sash, Doors, Blinds, &c.

Vincent & Campbell, Alvo, Neb., have dissolved partnership. J. M. Campbell has taken the Agricultural Implement stock and C. J. Vincent will continue in the Hardware line.

The Hardware store of Beddall & Short, Tamaqua, Pa., was robbed some time since of \$100 worth of Revolvers, Razors and Pocket Knives.

Kugel Bros., Hardware dealers, 2041 Germantown avenue, Philadelphia, Pa., have greatly increased their facilities for the display and sale of goods. Five hundred square feet of floor space has been added to the store and arrangements for storing a large stock of goods have been made in the upper floors of the building.

At a meeting of the Edwards & Chamberlin Hardware Company, Kalamazoo, Mich., held on the 3d inst., the resignation of A. K. Edwards as secretary and treasurer was accepted. William D. Edwards was elected secretary and A. K. Edwards treasurer, to fill the vacancy. William D. Edwards, who has been a stockholder since the organization of this company in 1893, and who has lately largely added to his holdings, will hereafter be closely identified with the management of the company. The large increase in the business of the concern during the past few years has made it imperative that a change of this nature be made. Mr. Edwards takes the position of buyer of Builders' Hardware, House Furnishing Goods, Tools, &c., and brings to the position much valuable experience, having until recently been vice-president and for 18 years general buyer of the Fletcher Hardware Company of Detroit.

John E. Insley, who has been for more than 30 years in the Hardware and Tool business, has commenced business on his own account at 12 North Sixth street, Philadelphia. Mr. Insley was for many years with the Biddle Hardware Company, and more recently for 15 years with W. P. Walters' Sons.

MISCELLANEOUS NOTES.

Taylor's Improved Tumbling Barrel.

Locke Regulator Company, Salem, Mass., are putting on the market Taylor's improved tumbling barrel for tumbling small castings of all kinds, also rivets, tacks, buttons, nails, &c. The barrel is so constructed that the contents may be examined, the inclination changed and the work dumped without stopping the machine. There are two sizes, the larger one weighing about 600 pounds,

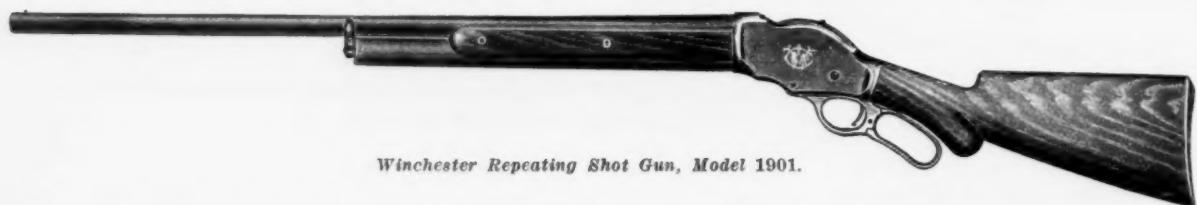
with a barrel measurement of 31 x 21 inches. The smaller one weighs about 275 pounds and the barrel measurement of this size is 20 x 15 inches. The manufacturers state that they have tested them thoroughly for more than two years and find them all right in every respect.

Muller's Bicycle Pump End Attachment.

A. Klein, 453-455 Broome street, New York, is the sole agent for Muller's bicycle pump end attachment, which, as indicated by the name, is an attachment for the end of a rubber tube in connection with an air pump. The feature of this device is that by means of a thumb lever it can be quickly attached to the valve stem of a tire and as quickly removed without the delay of screwing on a reducing or other nipple, securing an air tight connection that fits all existing valves even when threads are broken. One end of the spring lever which

Winchester Repeating Shot Gun, Model 1901.

Winchester Repeating Arms Company, New Haven, Conn., and 312 Broadway, New York, are just placing on the market a 1901 model Winchester repeating shot gun, as here illustrated. It is expressly bored to handle either smokeless or black powder, and is said to be particularly well adapted for duck and wild fowl shooting. The arm resembles in outline the original Winchester lever action repeating shot gun, but differs in detail. It has a tighter breech joint, more completely supporting the shell in the chamber, and a positive firing pin retractor. The finger lever is made separate from the breech block and with a finger lever lock. When the action is closed the gun is locked against opening by this finger lever lock, and is instantly released by a downward pressure on the finger lever. The standard gun is made with a 32-inch rolled steel barrel, hardened and browned



Winchester Repeating Shot Gun, Model 1901.

grips the valve stem is threaded so as to hold it securely but without marring the thread of the stem.

Spring Dividers and Spring Calipers.

Brown & Sharpe Mfg. Company, Providence, R. I., have just put on the market a group of spring dividers and outside and inside spring calipers, as here illustrated, the principal features of which, aside from quality and workmanship, are the spring and nut. The spring is of an improved form, unusually stiff and especially tempered. The ends of the spring terminate in



Fig. 1.—Spring Nut Fig. 2.—Spring Nut Fig. 3.—Spring Nut. Outside Calipers. Fig. 3.—Spring Nut Dividers.

convex lugs that fit into concave grooves, accurately milled in the ends of the legs, thus insuring the spring being held firmly in place and preventing the legs from springing sideways. The legs are dropped steel forgings of even taper and fine finish. The screw is of steel, hardened to prevent wear, which we are advised is unique in such construction. The spring nut used in connection with these goods is of new design and made on the principle of the spring chuck with the jaws hardened. It is positive in action when closing and the thread engages the screw with the slightest pressure upon the end of the jaws, while the withdrawal of the pressure causes the nut to release at once without regard to the manner in which it is held, the nut then sliding freely on the screw. It is dust proof and combines the security and smoothness of movement that the solid nut possesses, with the added advantage of quick adjustment. A thumb attachment is provided for the spring dividers. The outside calipers and dividers are made both with spring nut and solid nut in 2½, 3, 4, 5 and 6 inch sizes, and the inside calipers with both kinds of nut in 3, 4, 5 and 6 inch sizes. The company are also putting out with these goods a line of firm joint outside and inside calipers in 12 sizes, from 3 to 24 inches inclusive.

frame, and pistol grip stock of plain walnut, not checked, finished with a checked steel butt plate, and weighs about 8½ pounds. Barrels for this model are bored to shoot close and hard. Unless otherwise specified, guns with 32-inch full choked barrels will be sent, but shorter barrels or barrels with different styles of bore, either modified choke or full cylinder, will be supplied when so ordered without extra charge. Damascus barrels of different grades and other extras can be furnished at an advance on the regular price. The stock of this gun is 12½ inches long, and has a drop of 1½ inches at the comb and 2½ inches at the heel. Special stocks can be furnished at an extra cost. To load the magazine the lever is thrown down and five cartridges are pushed through the carrier into the magazine, placing the sixth in the chamber. The forward and backward motion of the finger lever, which can be executed while the gun is at the shoulder, throws out the empty shell, raises a new cartridge from the magazine and places it in the chamber, when the gun is again ready for firing.

Improved Star Safety Razor.

Kampfe Bros., 8 to 12 Reade street, New York, have just brought out a new model of the Star safety razor,

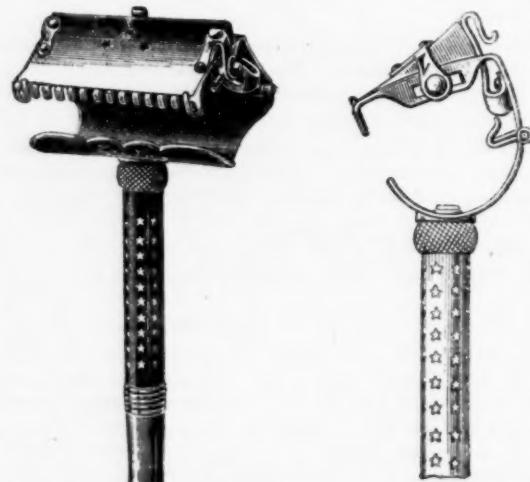


Fig. 1.—Star Safety Razor, Front View, Ready for Use. Fig. 2.—Side View, Showing Adjustable Clips for Narrow or Wide Blades.

the main features of which are shown in the accompanying illustrations, which are about two-thirds actual size. Fig. 1 illustrates the general appearance of the razor ready for use. It is entirely open at the front;

has no external projections to interfere with the surface to be shaved; lather can be quickly removed as the hinged frame can be thrown back with slight pressure, as indicated in Figs. 3 and 4, and the locking device works automatically. Particular attention is drawn to the rapidity and ease with which this safety razor can be cleaned and dried for future use, together with the improved arrangement of the sliding clips by means of which the inexpert can quickly adjust either wide or narrow blades, the relative position of the cutting

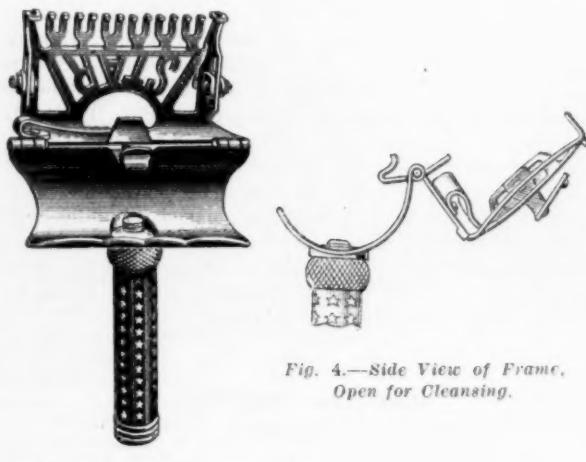


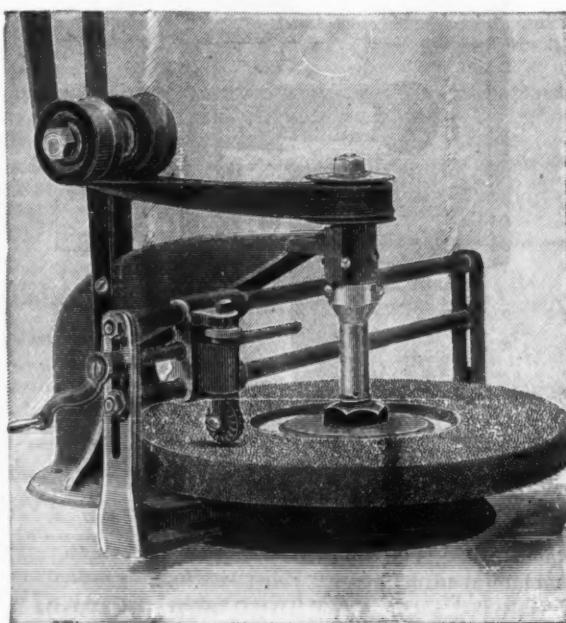
Fig. 3.—Inside View, Showing Automatic Lock.

edge being fixed by two strips of metal on either side below the clips, which are set originally for the ordinary beard, but can be easily changed to suit any beard. The fork-shaped teeth in the guard, better shown in Fig. 3, prevent clogging with lather and hair. The frame work is nickelated brass, the arrangement of the two piece handle being such that it can be disjointed for close packing, one of the handles also having a slot with which to adjust the side clips. This razor is a modification of and improvement on the Star safety razor which has been on the market for 25 years, the present frame being entirely different from any other safety razor.

Clipper and Surface Grinder.

The accompanying illustration represents a grinder for sharpening blades of clippers, &c., which is being introduced by John Van Benschoten, Poughkeepsie, N. Y. The machine consists of a frame with a horizontal arm

dresser is moved gradually across the surface of the stone by means of a small crank and a screw. The dresser is adjustable, so that any cut desired can be made. It is explained that owing to the accuracy with which the surface of the stone can be ground, the machine can be used for grinding such light surfaces as



Clipper and Surface Grinder.

blades of sausage cutters, meat choppers, dies, cutter knives, &c.

Ideal Hunting Knife.

Marble Safety Axe Company, Gladstone, Mich., have just put on the market another sportsman's specialty, in the form of a hunting knife with two styles of blade and handle, as here illustrated. The blades are made of fine razor steel, hollow ground and hand finished throughout, with a bone chopper back of the point, designed for rough work, thus reserving the keen knife edge for cutting and skinning. The tang extends the entire length of the handle and is threaded at the end. The guard is put on first, followed with layers of brass and fiber. The middle portion of the handle (leather or stag) is then put on. The butt portion of the handle is built up to correspond with the front part. When com-



Fig. 1.—Sportsman's Hunting Knife, Leather Laminated Handle.

plete the whole is subjected to heavy pressure and a tip of stag horn or Michigan buck is put in place, and the whole fastened together by a nut screwed onto the end of the tang, after which the handle is machined to shape and finished with a fine polish. Either pattern of blade can be supplied in each style of handle, and each knife is furnished with a black or russet leather sheath



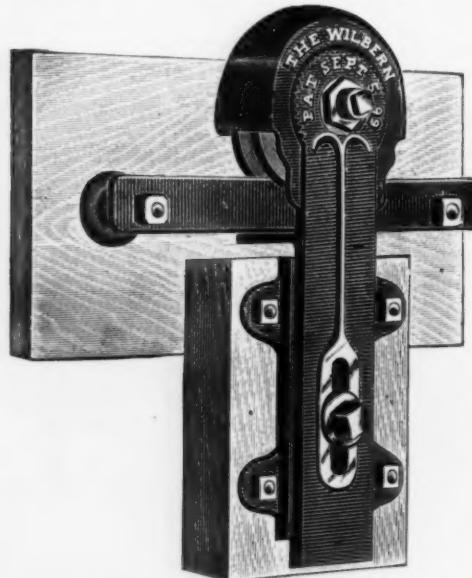
Fig. 2.—Hunting Knife, Polished German Stag Handle.

stone flat and true. The machine is shown in the illustration with a special truing attachment, consisting of two $\frac{1}{2}$ -inch rods fitted in supports on which is an emery wheel dresser. This arrangement is to permit the stone to be trued absolutely and the glaze removed without taking the shaft from its bearing. In operation the

with loop for a waist strap. Fig. 1 shows style No. 1, with laminated leather handle, brass and fiber trimmings at each end, and polished stag horn tip. Fig. 2 represents style No. 2, with polished German stag handle, fiber and brass trimmings at both ends, and polished stag horn tip.

The Wilbern Adjustable Door Hanger.

A new door hanger, herewith illustrated, is now being introduced to the trade by the Midland Iron Works of



The Wilbern Adjustable Door Hanger.

Racine, Wis. The company state that it has both vertical and lateral adjustment, is roller bearing, is so constructed

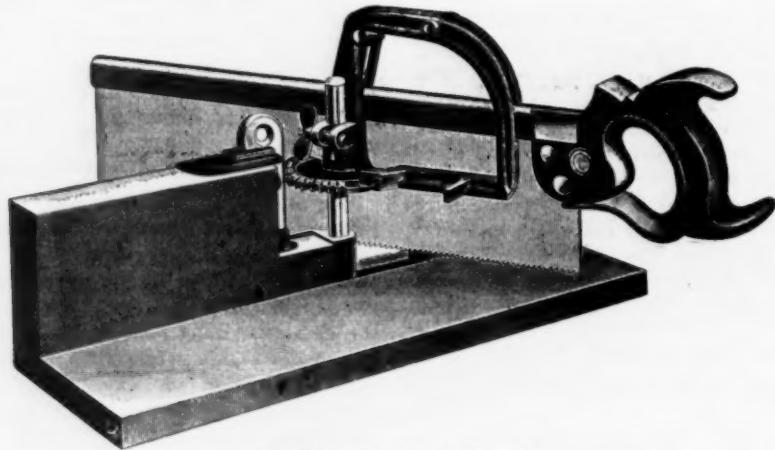
which passes under the track yet does not touch it, so that it will not bind. The hanger is made in two sizes, No. 1 with 4-inch sheave and No. 2 with 6-inch sheave. The company also make a patent lug which secures a very strong joint in the track and prevents the track from sagging.

The Hartzell Kitchen Knife No. 475.

The Emmert Hartzell Cutlery Company, Gettysburg, Pa., are introducing the kitchen knife herewith illustrated. It has a blade $4\frac{1}{4}$ inches long, hammer forged from bars of best cast steel, making a narrow tapering blade, and is tempered to the right degree to carry a good, keen cutting edge. The handle is of beech wood, of the proper size to allow a good grip. The knife illustrated is referred to as well adapted for kitchen use, suitable for cutting up fowls, game, fish, &c., and yet small enough for paring and cutting up vegetables. It is pointed out that the knife has a good size handle, well fastened so as to give the necessary purchase without cramping the hand. The knife, it is stated, is the same in material and temper as the other knives made by the company, and every blade is guaranteed.

Perfection Miter Box.

Tower & Lyon, 95 Chambers street, New York, have recently put on the market the Perfection miter box



Perfection Adjustable Miter Box.

that it cannot jump the track, is protected from the weather, is made of malleable iron, can be hung so that the door will be self closing, &c. The lateral adjustment is secured by means of the axle, which is threaded and turns in the hood. This axle is made of turned steel and is $\frac{1}{2}$ inch in diameter. It remains stationary and the wheel turns upon it. The wheel and roller are secured by a washer and the shoulder made by the threads on one side and by a washer and cotter on the other. The wheel is of gray iron. This can be replaced for a few cents if it wears out or is broken, so that the hanger possesses exceptional durability, for the arm is made of

here shown. It is detachable, and the construction is such that by means of a sliding key it can be instantly and rigidly adjusted to the more commonly used angles indicated on the dial by the letters R, M, P, H, O, and W. These indicate respectively a right angle or 90 degrees, a miter or 45 degrees, a pentagon or 36 degrees, a hexagon or 30 degrees, an octagon or $22\frac{1}{2}$ degrees and door and window sill pitch or 9 degrees. The device can be adjusted to any arbitrary angle by means of a clamp screw. There are projecting gauge points for setting with a bevel T-square when desired, and any saw may be used in connection with the box. The



The Hartzell Kitchen Knife No. 475.

the very best malleable iron and is reinforced by a strong rib. The vertical adjustment is secured by means of the ratchet and slide in the arm. This feature, it is stated, renders it possible to true a door to the casing, to make double doors fit snugly, to hang a door to an inclined floor, &c. The adjustment takes but a minute or two, and requires no tools but a wrench. The wheel is prevented from jumping the track by a lug on the arm;

guide may be lowered or raised at pleasure, and held in position by means of the clamp screw. This also enables the depth of cut to be gauged when a back saw is used. The arrangement of the parts is such that the tool may be instantly detached from the wooden box and folded so as to carry it in a tool chest. The guide is long, thus securing accuracy, and the tool is referred to by the manufacturers as strong and serviceable.

Gates, Molasses and Oil
Gates 30@50@10⁵

Gauges
Marking, Mortise, &c. 55@10@55@10⁵

Parrett's Comb. Boiler Gauge. 2 doz. \$6.75@7.35

Riley R. & L. Co.'s Butt & Babbet Gauge. 30@10⁵

Wire, Brown & Sharpe's. 25⁵

Wire, Morse's. 25⁵

Wire, P. S. W. Co. 30@50@10⁵

Climbers—Single Cut

Mail, Metal, Assorted, gro. \$1.40@1.60

Spike, Metal, Assorted, gro. \$2.80@3.25

Mail, Wood Handled, Assorted. gro. \$1.75@2.00

Spike, Wood Handled, Assorted. gro. \$3.25@3.50

Class, American Window

Jobbers' List, Jan. 21, 1901.

Less than Carloads 50@50@10⁵

Carloads 85@55⁵

3000 Boxes 87⁵

Glue—Liquid, Fish

List A, Bottles or Cans, with Brush. 57⁵@50⁵

List B, Cans (1/2 pts., pts., qts.) 53⁵@18⁵

List C, Cans (1/2 gal., gal.) 55@50⁵

International Glue Co. (Martin's) 4@10@50⁵

Glue Pots—See Pots, Glue.

Grease, Axle—

Common Grade, gro. \$5.00@6.00

Dixon's Everlasting, 10-pails, ea. 55⁵

Dixon's Everlasting, in bxs., 2 doz. 1 lb. \$1.20; 2 lb. \$2.00

Snow Flake: 1 qt. cans, per doz. \$2.00; 2 qt. \$3.20; 1/2 gal. cans, per doz. \$6.00; 5 gal. \$16.00; 5 gal. \$24.00

Grindstones—

Bicycle Grindstones, each \$2.50@3.00

Pike Mfg. Co.: Improved Family Grindstone, per inch, per doz. \$2.00 { 33@45

Pike Mower Knife and Tool Grinder, each. \$3.00

Velox Ball Bearing, mounted, Angle Iron Frame, each, \$3.25

Guards, Snow—

Cleveland Wire Spring Co.: Galv. Steel 1/100. \$9.00

Copper 1/100. \$18.00

Gun Powder—See Powder.

Hacks, Awl—

gro. Peg Patent, Leather Top. \$4.90@5.25

Peg Patent, Plain Top. \$3.50@3.75

Sewing, Brass Ferrule. \$1.50@1.60

Saddlers', Brass Ferrule. \$1.35@1.55

Peg, Common. \$1.25@1.55

Brad, Common. \$1.50@1.75

Halters and Ties—

Covert Mfg. Co.: Web. 45@25

Jute Rope. 45@25

Sisal Rope. 30@25

Covert's Saddle Works: Web and Leather Halters. 70⁵

Jute and Manila Rope Halters. 70⁵

Sisal Rope Halters. 60@20

Manila and Cotton Rope Ties. 70⁵

Sisal Rope Ties. 60@30

Hammers—

Handled Hammers—

Heller's Machinists. 50@50@5⁵

Heller's Farriers. 50@50@5⁵

Magnetic Tack, Nos. 1, 2, 3, \$1.35, \$1.50, \$1.75

Peck, Stow & Wilcox. 50@10⁵

Fayette R. Plumbe. 40@10@7⁵

Engineering and B. S. Hand. 60@10@2⁵

Machinists' Hammers. 60⁵

Riveting and Timmers. 40@10@7⁵

Sargent's U. S. New List. 40⁵

Heavy Hammers and Sledges—

2 lb. and under. 1b. 45⁵

3 to 5 lb. 1b. 36⁵ \$80.10@80⁵

Over 5 lb. 1b. 30⁵ { 10@10⁵

Wilkinson's Smiths'. 91/2@100 lb.

Handcuffs and Leg Irons

See Police Goods.

Handles—

Agricultural Tool Handles—

Axe, Pick, &c. 60@60@10⁵

Hoe, Rake, Fork, &c. 60@60@10⁵

Shovel, &c., Wood D Handle. 50@50@5⁵

Cross-Cut Saw Handles—

Axle, 40@45@10⁵

Champion. 40@45@10⁵

Diaston's. 50⁵

Mechanics' Tool Handles—

Auger, assorted. gro. \$2.50@2.50

Brad Awl. gro. \$1.25@1.50

Chisel Handles:

Apple Tanged Firmer, gro. ass'd. \$2.25@2.35; large, \$2.50@2.60

Hickory Tanged Firmer, gro. ass'd. \$1.75@2.20; large, \$2.50@2.70

Apple Socket Firmer, gro. ass'd. \$1.70@2.15; large, \$2.00@2.25

Hickory Socket Firmer, gro. ass'd. \$1.60@2.15; large, \$2.15@2.20

Bickley Socket Framing, gro. ass'd. \$2.50@2.75; large, \$2.65@2.85

File, assorted. gro. \$1.60@2.15

Hammer, Hatchet, Axe, &c. 60@10⁵

Hand Saw, Varnished, doz. 70@75⁵

Not Varnished. 55@80⁵

Plane Handles:

Jack, doz. 55⁵; Jack Bolted. 55@60⁵

For, doz. 55@35⁵; Fore, Bolted. 70@75⁵

Nicholson Simplicity File Handle, 2⁵ gro. 50@55@15⁵

Hangers—

Barn Door, New Pattern, Round Groove, Regular:

Inch. 5 4 5 6 5

Doz. \$0.85 1.20 1.30 1.20 1.30

Barn Door, New England Pattern, Check Back, Regular:

Inch. 5 4 5 6

Doz. \$1.30 1.75 2.50 3.00

Chicago Spring Butt Co.:

Friction. 25⁵

Oscillating. 25⁵

Big Twin. 25⁵

Chisholm & Moore Mfg. Co.:

Baggage Car Door. 50⁵

Elevator. 40⁵

Railroad. 55⁵

Cronk Hanger Co.:

Loose Axle. 60⁵

Roll R Bearing. 60@10⁵

Lane Bros.:

Parlor, Ball Bearing. 40⁵

Parlor, Standard. 45@25

Parlor, New Model. 45@25

Parlor, New Champion. 45@25

Barn Door, Standard. 60@10⁵

Covered. 50@10@10⁵

Special. 60@10⁵

Lawrence Bros.:

Advance. 60⁵

Cleveland. 70⁵

Or. 60⁵

New York. 60⁵

Poerries. 60@10⁵

Starling. 60⁵

McKinney Mfg. Co.:

No. 1, Special. 81⁵

No. 2, Standard. 81⁵

Stowell Mfg. and Foundry Co.:

Acme Parlor Ball Bearing. 40⁵

Atlas. 60⁵

Badger Barn Door. 50⁵

Baggage Car Door. 50⁵

Climax Anti-Friction. 50⁵

Elevator. 40⁵

Express. 50⁵

Interstate. 10⁵

Lundy Parlor Door. 50⁵

Magic. 50⁵

Matchless. 50⁵

Payson Mfg. Co.:

Oblique. 50@10⁵

Stover Mfg. Co.:

Ideal, No. 16, Detachable. 50⁵

Extra 5@10⁵ often given on most of these Hinges.

Hinges only \$1.20 1.49 2.00

Latches only 60 80 85

New England:

With Latch. doz. @ \$1.55

Without Latch. doz. @ \$1.25

Reversible Self-Closing:

With Latch. doz. @ \$1.30

Without Latch. doz. @ \$1.45

Western:

With Latch. \$1.40@1.75

Without Latch. doz. \$0.95@1.20

Wrightsville's E' H'dware Co.:

Shepard's or Clark's doz. sets, Nos. 1, 2, 3, 4

Hinges with Latches. \$1.20 2.00 2.75

Hinges only. 1.20 1.50 2.10

Latches only. 60 80 70

Spring Hinges—

Holdback, Cast Iron. gro. \$7.00@7.25

Non-Holdback, Cast Iron. gro. \$6.50@6.75

Coat and Hat, Stowell's

Coat and Hat, Reading. 70@72@75⁵

Coat and Hat, Wrightsville. 65@10⁵

Harness, Reading List. 70@10@75⁵

Wire—

Belt. 80⁵

Wire C. & H. Hooks. 60@10@60@10⁵

Atlas Coat and Hat:

Single Cases. 45⁵

10 Case Lots. 45@10⁵

Czar Harness. 50@10@5⁵

Wire Coat and Hat:

Acme. 60⁵

B. B. 60⁵

V. Braco, Chief and Capt. 60⁵

Gem. 60⁵

Bright Wire Goods—See Wire.

Wrought Iron—

Box, 6 in., per doz. \$1.50; 8 in., \$1.75;

10 in., \$2.00.

Cotton. doz. \$1.00@1.25

Wrought Staples, Hooks, &c.—

See Wrought Goods.

Miscellaneous—

Bush, Light, doz. \$5.50; Medium, \$6.00; Heavy, \$6.50

Grass. Nos. 1 2 3 4

Best. \$1.50 1.75 2.00

Common. 1.20 1.50 1.80

Potato and Manure. 70⁵

Whiffletree. 70.49@6

Hooks and Eyes:

Brass. 60@10@100@100⁵

Malleable Iron. 70@70@10@10⁵

Coverd Saddlery Works' Self Locking Gate and Dooz Hook. 60⁵

Crown Picture. 50@10⁵

Bench Hooks—See Bench Stoops.

Corn Hooks—See Knives, Corn.

Horse Nails— See Nails, Horse.

Horseshoes— See Shoes, Horse.

Hose, Rubber—

Garden Hose, 1/4-inch:

Competition. ft. 14@14⁵

3-ply Standard. ft. 5 6 6 6

4-ply Standard. ft. 8 9 9 9

5-ply Standard. ft. 8 9 10 10

6-ply Standard. ft. 9 10 10 10

7-ply Standard

Ladies— Melting—	
L. & C. Mfg. Co.,	25%
P. S. & W.	5%
Heading.	65%
Sargent's.	40@40&10%
Lanterns— Tubular—	
Regular Tubular.	... 25@40@4.75
Side Left Tubular.	... 24.75@4.75
Square Left & Tubular.	... 34.75@5.25
Other Styles.	... 40@10@40@10@5%
Bull's Eye Police—	
No. 1, 2½ inch.	... \$3.00
No. 2, 3 inch.	... \$4.00
Latches, Thumb—	
Roggin's Latches.	... doz. 30@35
Lawn Mowers—	
See Mowers, Lawn.	
Leaders, Cattle—	
Small.	... doz. 50¢; large, 85¢
Covert Mfg. Co.	... 45&5%
Lemon Squeezers—	
See Squeezers, Lemon.	
Lifters, Torsom—	
Solid grip, Payson Mfg. Co.	... 80¢
R. & E.	... 45¢
Lines—	
Wire Clothes, Nos. 18	19 20
100 feet.	... \$2.20 2.00 1.65
75 feet.	... \$1.80 1.70 1.50
Ossawam Mills.	
Crown Solid Braided Chalk.	... 33@5%
Mason's, No. 0 to No. 5.	33@5%
Samson Cordage Works:	
Solid Braided Chalk, no. 0 to 3.	10¢
Silver Lake Braided Chalk, No. 0, \$6.00;	
No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50	
7 gr.	
Locks— Cabinet—	
Cabinet Locks.	... 33@5@33@7@3%
Door Locks, Latches, &c.—	
[Net prices are very often made on these goods.]	
Reading Hardware Co.	... 50¢
R. & E. Mfg. Co.	... 10¢
Sargent & Co.	... 40@40@10
Elevator—	
Stowell's.	... 40¢
Padlocks—	
Wrought Iron.	... 75¢@10@80%
R. & E. Mfg. Co. Wrt Steel d Brass.	50%
Sash, &c.—	
Fitch's:	
Bronze and Brass.	66@%
Iron.	70%
Lee's Patent:	
Bronze and Brass.	62@%
Iron.	55%
Wrought Bronze and Brass.	55@10%
Wrought Steel.	50%
Passey's signal.	50%
Reading.	60@10@10@70%
Machines— Boring—	
Without Augers.	
Upright, Angular.	
Improved No. 3, \$4.25	No. 1 \$5.00
Improved No. 4, 3.75	No. 2 3.38
Improved No. 5, 2.75	
Jennings'.	2.50 3.00
Millers Falls.	5.75
Snell's Rice's Pat.	2.50 2.75
Swan's, No. 500.	5.10 No. 200 0.45
Hoisting—	
Moore's Anti-Friction Differential Pulley Block.	30%
Moore's Hand Hoist, with Lock Brake.	20%
Moore's Portable Pneumatic Hoist.	25%
Ice Cutting—	
Chandler's.	15%
Washing—	
Wayne American.	... per doz. \$28.00
Western Star, No. 2.	... per doz. 28.00
Western Star, No. 3.	... per doz. 30.00
St. Louis, No. 41.	... per doz. 60.00
Mallets—	
Door—	
Electric Steel (W. G. Co.).	10%
Mattocks—	
See Picks and Mattocks.	
Meat Cutters—	
See Cutters, Meat.	
Milk Cans—See Cans, Milk	
Mills— Coffee—	
Enterprise Mfg. Co.	25@30%
National, list Jan. 1, '94.	30%
Parker's Columbian and Victor.	
Mats—	
Door—	
Electric Steel (W. G. Co.).	10%
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Parker's Columbian and Victor.	</td

Jobbers \$0.50@1.00, and Common, Plain Back Shovels are generally sold by jobbers at about \$6.75.

Sieves and Sifters-

Hunter's Imitation, gro. \$9.50@10.00
Buffalo Metallo Blued, S. & Co., \$4.00
18x18 10x18 18x20
\$15.00 \$13.50 \$15.00

F. J. Meyers' Mfg. Co.:
Sifters..... \$4.00
Excelsior..... \$4.00
Hunter's Genuine..... \$4.00
No Name, Hunter's..... \$4.00
Standard..... \$4.00
Shaker (Barley's) Flour Sifters, \$2.00
W. doz. \$2.00.

Sieves, Tin Rim— Per dozen

Mesh..... 15 16 18 20
Black, full size..... \$0.95 .98 1.00 1.10
Plated, full size..... \$1.05 1.08 1.10 1.20
Black, scant..... 20.78 .80 .85

Sieves, Wooden Rim— Nested, 10, 11 and 12 Inch.

Mesh 18, Nested, doz..... \$0.65@0.75
Mesh 20, Nested, doz..... .75@.85
Mesh 21, Nested, doz..... .90@1.00

Sinks—

Cast Iron—

Standard list..... \$5.00@5.50@10%
Note.—There is not entire uniformity
Note used by jobbers.

Wrought Steel—

New Era, Galv'd and Enamelled..... 70@75%
New Era, Painted..... 70@75%
L. & G. Mfg. Co., Galvanized..... 50%
L. & G. Mfg. Co., Enamelled..... 50%

Skeins, Wagon—

Cast Iron..... 70@75%
Malleable Iron..... 50@10@50%
Steel..... 40@40@10%

Slates—

Factory Shipments.

"D" Slates..... 50@10@10@10%
Unexcelled, etc., Noiseless Slates, 60
8 tens %

Victoria, etc., Noiseless Slates, 60c
7 tens 45%

Wire Bound..... 50@10@50%
Web Hinge..... 50%

Saw Cutters—See Cutters.

Slicers, Vegetable—

Sterling \$2.00..... 33%

Snaps, Harness—

German..... 40@40@10%
Covert Mfg. Co.:
Derby..... 35@5%
High Grade..... 45@5%

Jockey..... 40@25%
Trojan..... 45@25%
Yankee..... 35@25%
Yankee, Roller..... 30@25%

Covert's Saddlery Works:
Crown..... 60%
German..... 60%
Model..... 60%
Triumphant..... 60%

W. & E. T. Fitch Co.:
Bristol..... 40@10%
Empire..... 50@5%
German..... 40%
National..... 50@5%
Perfect..... 45@5%

Clipper..... 50@5%
Champion..... 40%
Security..... 40%
Victor..... 60@5%

Oneida Community:
Solid Steel..... 65@65@10%
Solid Silver..... 65@10@65@10@10%
Bartlett's Patent Guarded..... 60@10%

Snaths—

Sythe..... 45@5@5%
Snips, Tinner's—See Shears.

Soldering Irons—

See Irons, Soldering.

Spoke Trimmers—

See Trimmers, Spoke.

Spoons and Forks—

Silver Plated—

Good Quality..... 50@10@60@10@5%
Cheap..... 60@10@10%

International Silver Co.:
1847 Rogers Bros..... 40@10%
Rogers & Bro., William Rogers Eagle
Brand, and Rogers & Hamilton, 30@10%

Anchor, Rogers Brand..... 60%
Wm. Rogers & Son..... 60@10%

Bimeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware..... 60%
No. 77 Silver Plated Ware..... 60@10%

Miscellaneous—
German Silver..... 60@10@80@10@10%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list
1@10%

Tinned Iron—

Teas..... per gro. 45@5%
Tables..... per gro. 90c@1.00

Springs—

Door—

Gem (Coll)..... 20%
Star (Coll)..... 30%
Torrey's Rod, 39 in. \$1.10@1.25
Victor (Coll)..... 50@10@10%

Carriage, Wagon, &c.

1/4 in. and Wider:

Black or 1/4 Bright, lb..... 5c
Bright, lb..... 5@6c

Painted Seat Springs:
1/4 x 2 26 and smaller, per pr. 4@1.4c
1/4 x 2 x 28 per pr. 5@4@5c
1/4 x 2 x 28 and narrower, per pr.
70@75c

Sprinklers, Lawn—

Enterprise..... 25@29%
Philadelphia No. 1, \$1 doz. \$12; No. 2,
\$15; No. 3, \$24..... 30%

Squares—

Nickel plated..... List Jan. 5, 1901
Steel and Iron..... 70@10@75%

Rosewood Hdl. Try Square and T-Bevels..... 60@10@10@70%

Iron Hdl. Try Squares and T-Bevels..... 60@10@40@10@20%

Douston's Try Sq. and T-Bevels..... 60@10%
Winterbottom's Try and Miter..... 50@10%

Squeezers—

Lemon—

Wood, Common, gro., No. 0, \$5.25
\$25.65; No. 1, \$6.25@6.50
Wood, Porcelain Lined:
Cheap..... doz. \$2.00@2.75
Good Grade..... doz. \$3.00@3.50
Tinned Iron..... doz. \$0.75@1.25
Iron Porcelain Lined..... \$3.90@3.25
Jennings' Star..... \$1.85@1.90

Staples—

Barbed Blind..... lb. 7@7@4c
Electricians' Association list.....
80c@10@10@10%

Fence Staples, same price as Barbed
Wire, See Trade Report.

Poultry Netting, Staples, per lb.

Grand Crossing Tack Co.'s list..... 80@10%

Steels, Butchers'—

Dick's..... 30%
Foster Bros. 30%
Hartzel Cutlery Co. 40@5%
C. & A. Hoffmann's..... 40%

Steelyards—

Stocks and Dies—
Blacksmiths'..... 40@40@10%
Gardner Die Stocks No. 1..... 50%
Gardner Die Stocks, larger sizes..... 40%
Green River..... 40%
Lightning Screw Plate..... 25%
Little Giant..... 25%
Reece's New Screw Plates..... 25@30%
Curtis Reversible Ratchet Die Stock. 35%

Stone—

Scythe Stones—
Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 inch, \$3.00 per
gro., 12 inch, \$10.00

Pike Mfg. Co. 1901 list:
Black Diamond S. S. \$12.00
Lamollie S. S. \$11.00
White Mountain S. S. \$9.00
Green Mountain S. S. \$6.00
Extra Indian Pond S. S. \$7.50
No. 1 Indian Pond S. S. \$7.00
No. 2 Indian Pond S. S. \$4.50
Leader End S. S. \$4.00
Leader of 1901 list. \$3.50

Oil Stones, &c.

Chicago Wheel & Mfg. Co. 1901 list:
Gem Corundum Oil, Double Grit..... 50%

Gem Corundum Axe, Single or Double
Grit..... 55%

Gem Corundum Slips..... 55%

Gem Corundum Razor Hones..... 35%

Pike Mfg. Co. 1901 list:
Arkansas Stone, No. 1, \$10.50@10.50
Arkansas Stone, No. 1, 5@10@10.50

Arkansas Slips, No. 1..... \$4.00

Lily White Washita 4 to 8 in. 60%

Red Rod Washita, to 8 in. 60%

Washita Stone, Extra, to 8 in. 50%

Washita Stone, No. 1, 4 to 8 in. 40%

Washita Stone, No. 2, 4 to 8 in. 30%

Lily White Slips..... 90c

Rosy Rod Slips..... 90c

Washita Slips, Extra..... 80c

Washita Slips, No. 1..... 70c

India Oil Stones (entire line)..... 35%

Hindostan No. 1, Regular..... \$10@10%
Hindostan No. 1, Small..... \$10@10%

Axe Stones (all kinds)..... 35@5%

Turkey Oil Stones, ex 5 to 10 in. \$8.00@8.50

Queer Creek Stones, 4 to 8 in. 30%

Queen Creek Slips..... 90c

Sand Stone..... 5c@40%

Belgian, German and Swat Razor
Hones..... 40%

Natural Grit Carving Knife Hones,
per doz. \$3.00

Quick Edge Pocket Knife Hones,
per doz. \$3.00

Mounted Kitchen Sand Stone, per
doz. \$1.00

Tanite Mills: Emery Oil, \$5.00..... 50@80%

Stove Polish—See Polish, Stove.

Strainers, Pump—Diamond Joe Pump Strainers, per doz. 75c

Straps, Box—Cary's Universal case lots..... 20@10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 55@65c
Sockets..... doz. \$1.75

Straps, Razor—Smith & Hemenway Co. 70%

Stuffers, Sausage—Enterprise..... 25@30%

Stops, Bench—Millers Falls..... 15@10%
Morrill's..... \$1.00, No. 1, \$10.00, 50@20%
Morrill's, No. 2, \$11.00..... 50@10%

Stops, Window—Ives' Patent..... 25@35%

Stove Boards—See Boards, Stove.

Stove Polish—See Polish, Stove.

Strainers, Pump—Diamond Joe Pump Strainers, per doz. 75c

Straps, Box—Cary's Universal case lots..... 20@10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 55@65c
Sockets..... doz. \$1.75

Stuffers, Sausage—Enterprise..... 25@30%

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Strainers, Pump—Diamond Joe Pump Strainers, per doz. 75c

Straps, Box—Cary's Universal case lots..... 20@10%

Stretchers, Carpet—

Brass Surface: Brass King, Single Surface, open back.....\$3.00	Some Foundries make price \$12@\$3 lower.	Brass and Copper Wire on Spools.. 60¢5@80¢10%	Combination Black.....40¢5%
Nickel Plate Surface: No. 1001 Nickel Plate, Single Surface .....\$3.00	Well Buckets, Galvanized See Pails, Galvanized.	Brass, list Feb. 26, '96.....25¢	Combination Bright.....40¢5%
Washers—	Wheels Well—	Copper, list Feb. 26, '96.....15¢	Cylinder or Gas Pipe.....55¢
Leather, Axle—	8-in., \$1.50@2.75; 10-in., \$1.80@3.10; 12-in., \$2.50@2.75; 14-in., \$3.75@4.65	Cast Steel Wire.....50¢	Extra Heavy.....45¢
Solid.....\$55¢@85¢10%	Wire and Wire Goods—	Stub's Steel Wire.....\$6.00 to £.40%	Merrick's Pattern.....50¢
Patent.....85¢10@85¢20%	Bright and Annealed:	Wire Clothes Line, see Lines.	No. 3 Pipe, Bright.....55¢
Code: 3¢ 1 1/4 1 1/2 1 1/4 1 1/2 1 1/4 10c 11c 12c 13c per 100	6 to 9.....75¢5@75¢5@10%	Wire Picture Cord, see Cord.	Bindley Automatic.....30¢
Iron or Steel—	10 to 13.....75¢10@75¢10@10%	Bright Wire Goods—	Boardman's.....
Size bolt....5-16 3¢ 3¢ 7¢ 7¢ 3¢ Washers....\$6.10 4.0 2.0 2.0 2.50	14 to 18.....75¢10@75¢10@10%	Coes' "Genuine".....40¢10@50¢10%	
In lots less than one keg add 1¢ per lb., 6-lb. boxes add 3¢ to list.	19 to 26.....75¢10@75¢10@7.5¢5	Coes' " Mechanics".....40¢10@10¢5@20¢	
Cast Washers—	27 to 36.....75¢10@7.5¢5@8.10¢2.5¢5	Douphine's Engineer.....40¢10¢	
Over 1/4 inch, barrel lots. per lb.... 1 1/2@13¢	Galvanized:	Elgin Wrenches.....50¢10¢	
Washer Cutters—	6 to 18.....75¢10@7.5¢5@10%	Elgin a Monkey Wrench Pipe Jaws,.....33¢14¢	
See Cutters, Washer.	19 to 26.....75¢10@7.5¢5@10%	Gem Pocket.....30¢	
Washing Machines—	27 to 36.....75¢10@7.5¢5@10%	Hercules.....	
See Machines, Washing.	Coppered:	Knife Handle, Machinists (W. & B.), Case lots.....	
Water Coolers—	6 to 9.....70¢5@70¢5@10%	Less than case lots.....50¢10¢	
See Coolers, Water.	10 to 18.....70¢10@70¢10¢5@10%	Improved Pipe (W. & B.).....60¢5¢	
Wedges—	19 to 26.....75¢10@75¢10@7.5¢5	Solid Handles, P. S. & W. ....50¢@50¢10%	
Oil Finish.....lb. 2.90@3.10¢	27 to 36.....75¢10@75¢10@7.5¢5	Triumph.....60¢@10¢	
Weights, Sash—	Tinned:	Wrought Goods—	
Per ton, f.o.b. factory....\$19.00@22.50	6 to 14.....75¢@75¢10¢5	Staples, Hooks, &c., list March 17 '96.....85¢5@5¢@40¢	
	15 to 18.....75¢10@75¢10¢5	Yokes, Neck—	
	19 to 26.....70¢10@70¢10¢5	Covert Saddlery Works, Trumpton.....60¢25¢	
	27 to 36.....70¢10@70¢10¢5	Covert Saddlery Works, Neck Yoke Centers.....70¢	
	Annealed Wire on Spools....70¢5@70¢ d10¢	Yokes, Ox, and Ox Bows—	
		Fort Madison's Farmers & Freighters.. list not	
		Zinc—	
		Sheet.....lb 8¢c@6¢5¢	

PAINTS, OILS AND COLORS—Wholesale Prices.

White Lead, Zinc, &c.	
Lead, Foreign white, in Oil.....	7½@ 9%
Lead, American White, in Oil:	
Lots of 500 lb or over.....	6½
Lots less than 500 lb.....	6@ 7
Lead, White, in oil, 25 lb tin pails, add to keg price.....	6@ 6½
Lead, White, in oil, 12½ lb tin pails, add to keg price.....	6@ 6½
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price.....	6@ 6½
Lead, White, Dry in bbis.....	5½@ 6
Lead, American. Terms: On lots of 500 lbs, and over, 60 days, or 3% for cash if paid in 15 days from date of invoice.	
Zinc, American, dry.....	7 D 4½@ 4%
Zinc, Paris, Red Seal, dry.....	8@ 8½
Zinc, Paris, Green Seal, dry.....	6@ 9½
Zinc, Antwerp Red Seal, dry.....	6@ 6½
Zinc, Antwerp, Green seal, dry.....	7 D 7½
Zinc, V. M. French, in Poppy Oil, Green Seal:	
Lots of 1 ton and over.....	12@ 12½
Lots of less than 1 ton.....	12½@ 12½
Zinc, V. M. French, in Poppy Oil, Red Seal:	
Lots of 1 ton and over.....	10½@ 11½
Lots of less than 1 ton.....	11@ 11½
DISCOUNTS—V. M. French Zinc.—Discounts to buyers of 10 bbls, lots of one or assorted grades, 1½; 25 bbis, 2½; 50 bbis, 4½.	
Dry Colors.	
Black, Carbon.....	7 D 8@ 20
Black, Drop, Amer.....	4@ 7
Black, Drop, Eng.....	11@ 11
Black, Ivory.....	12@ 21
Lamp, Com.....	14@ 6
Blue, Celestial.....	14@ 6
Blue, Chinese.....	50@ 35
Blue, Prussian.....	28@ 34
Blue, Ultramarine.....	4@ 20
Brown, Spanish.....	4@ 1
Brown, Vandyke, Amer.....	14@ 2½
Brown, Vandyke, Foreign.....	2½@ 3½
Carmine, No. 40.....	7 D 2½@ 2½
Green, Chrome, ordinary.....	5@ 6½
Green, Chrome, pure.....	16@ 29
Lead, Red, bbis, ½ bbis, and kegs:	
Lots 500 lb or over.....	6@ 6
Lots less than 500 lb.....	6@ 6½
Litharge, bbis, ½ bbis, and kegs:	
Lots 500 lb or over.....	6@ 6
Lots less than 500 lb.....	6@ 6½
Ocher, French Washed.....	1½@ 1½
Ocher, Dutch Washed.....	4½@ 5
Ocher, American.....	7 ton \$10.00@ 15.00
Yellow Mineral, English.....	7 D 8@ 15
Orange Mineral, French.....	11½@ 11½
Orange Mineral, German.....	8@ 9½
Red, Indian, English.....	4½@ 8½
Red, Indian, American.....	3@ 4½
Red, Turkey, English.....	4@ 6
Red, Tuscan, English.....	7@ 10
Red Venetian Amer, \$100 b.....	80@ 1.75
Sienna, Italian, Burnt and Powdered.....	3½@ 7½
Sienna, Ital. Raw, Powd.....	3½@ 7½
Sienna, American, Raw.....	1½@ 2
Sienna, American, Burnt and Powdered.....	7 D 1½@ 2
Talc, French.....	7 D 100 b \$1.25@ 1.50
Talc, American.....	.90@ 1.10
Terra Alta, French, \$100 b .95@ 1.00	
Terra Alta, English.....	.95@ 1.00
Terra Alta, American, No. 1.....	.85@ 85
Terra Alta, American, No. 2.....	.45@ 50
Umber, Turkey, Burnt & Powd, 7 D 2½@ 3½	
Umber, Turkey, Raw & Powd, 7 D 2½@ 3½	
Umber, But. Amer.....	1½@ 9
Umber, Raw, Amer.....	1½@ 9
Yellow, Chrome.....	10@ 25
Vermillion, American Lead.....	10@ 40
Vermillion, Quicksilver, bulk.....	.67@ 70
Vermillion, Quicksilver, bags.....	.67@ 70
Vermillion, English, Import.....	.80@ 205
Vermillion, Chinese.....	.81.05@ 1.20
Colors in Oil.	
Black, Lampblack.....	12@ 14
Blue, Chinese.....	36@ 40
Blue, Prussian.....	39@ 35
Blue, Ultramarine.....	13@ 16
Brown, Vandyke, Amer.....	14@ 2½
Brown, Vandyke, Foreign.....	2½@ 3½
Carmine, No. 40.....	7 D 2½@ 2½
Green, Chrome, ordinary.....	5@ 6½
Brown, Vandyke, pure.....	16@ 29
Lead, Red, bbis, ½ bbis, and kegs:	
Lots 500 lb or over.....	6@ 6
Lots less than 500 lb.....	6@ 6½
Litharge, bbis, ½ bbis, and kegs:	
Lots 500 lb or over.....	6@ 6
Lots less than 500 lb.....	6@ 6½
Ocher, French Washed.....	1½@ 1½
Ocher, Dutch Washed.....	4½@ 5
Ocher, American.....	7 ton \$10.00@ 15.00
Yellow Mineral, English.....	7 D 8@ 15
Orange Mineral, German.....	8@ 9½
Red, Indian, English.....	4½@ 8½
Red, Indian, American.....	3@ 4½
Red, Turkey, English.....	4@ 6
Red, Tuscan, English.....	7@ 10
Red Venetian Amer, \$100 b.....	80@ 1.75
Sienna, Italian, Burnt and Powdered.....	3½@ 7½
Sienna, Ital. Raw, Powd.....	3½@ 7½
Sienna, American, Raw.....	1½@ 2
Sienna, American, Burnt and Powdered.....	7 D 1½@ 2
Talc, French.....	7 D 100 b \$1.25@ 1.50
Talc, American.....	.90@ 1.10
Terra Alta, French, \$100 b .95@ 1.00	
Terra Alta, English.....	.95@ 1.00
Terra Alta, American, No. 1.....	.85@ 85
Terra Alta, American, No. 2.....	.45@ 50
Umber, Turkey, Burnt & Powd, 7 D 2½@ 3½	
Umber, Turkey, Raw & Powd, 7 D 2½@ 3½	
Umber, But. Amer.....	1½@ 9
Umber, Raw, Amer.....	1½@ 9
Yellow, Chrome.....	10@ 25
Vermillion, American Lead.....	10@ 40
Vermillion, Quicksilver, bulk.....	.67@ 70
Vermillion, Quicksilver, bags.....	.67@ 70
Vermillion, English, Import.....	.80@ 205
Vermillion, Chinese.....	.81.05@ 1.20
Miscellaneous.	
Barytes, Foreign, 7 ton \$19.00@ 21.00	
Barytes, Amer. floated.....	19.00@ 20.00
Barytes, Crude, No. 1.....	8.00@ 10.00
Chalk, in bulk.....	7 ton 2.50@ 2.60
Chalk, in bbis, 7 ton 2.50@ 2.60	
Chalk, in bbis, 7 ton 2.50@ 2.60	
China Clay, English, 7 ton 12.00@ 17.50	
Cobalt, Oxide.....	7 ton 2.20@ 2.50
Whiting, Common, 7 ton .40@ .60	
Whiting, Gilders.....	.45½@ .65
Whiting, extra Gilders'.....	.55@ .68
Putty.	
In bladders.....	\$2.25
In bulk.....	1.25
In cans 1 D to 3 D.....	3.25
In cans 12 D to 25 D.....	2.25
Spirits Turpentine.	
In Southern bals.....	38@ 38½
In machine bals.....	36½@ 37½
Glue.	
Cabinet.....	11½@ 16
Extra White.....	18@ 23
French.....	12@ 40
Irish.....	13½@ 16
Low Grade.....	7 D 9@ 12
Medium White.....	14½@ 16½
Mineral Oils.	
Black, 20 gravity, 25@ 30 cold test.....	7 gal 9½@ 10½
Black, 29 gravity, 15 cold test, 10½@ 11½	
Black, summer.....	9½@ 9
Cylinder, light filtered.....	14½@ 17
Cylinder, dark filtered.....	11½@ 15
Paraffine, 903-007 gravity.....	12@ 12½
Paraffine, 903 gravity.....	11½@ 11½
Paraffine, 883 gravity.....	9½@ 10
Paraffine, red, No. 1.....	12½@ 13½
In small lots 14½ advance.....	
Linseed, City, boiled.....	5½@ 5½
Linseed, State and West'n, raw 45.....	4½@ 4½
Linseed, raw Calcutta seed.....	2½@ 2½
Lard, Prime.....	7½@ 7½
Lard, Extra No. 1.....	5½@ 5½
Lard, No. 1.....	4½@ 4½
Cotton-seed, Crude.....	2½@ 2½
Cotton-seed, Summer Yellow, prime.....	40@ 41
Cotton-seed, Summer Yellow, oil grades.....	37½@ 38
Sperm, Crude.....	2½@ 2½
Sperm, Natural Spring.....	2½@ 2½
Sperm, Bleached Spring.....	2½@ 2½
Sperm, Natural Winter.....	6½@ 6½
Sperm, Bleached Winter.....	6½@ 6½
Whale, Natural Winter.....	4½@ 4½
Whale, Bleached Winter.....	4½@ 4½
Menhaden, Crude, Sound.....	2½@ 2½
Menhaden, Light Strained.....	2½@ 2½
Menhaden, Bleached Winter.....	9½@ 9½
Menhaden, Ex Bleached Winter.....	9½@ 9½
Tallow, prime.....	5½@ 5½
Cocoanut, Ceylon.....	5½@ 6
Cocoanut, Cochin.....	9½@ 9½
Cod, Domestic.....	32@ 33½
Cod, Newfoundland.....	35@ 36
Red Elaine.....	35@ 36
Ped Saponified.....	7 D 5½@ 5½
Olive, Italian, bbis.....	58@ 61
Neatsfoot, prime.....	52@ 53
Palm, prime, Lagos.....	7 D 5½@ 6

THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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UNITED STATES AND BRITISH AMERICA.

Regular Edition, Issued every THURSDAY morning, - - - - - \$5.00 a year
Two Dollar Edition, large number FIRST and THIRD THURSDAYS of every month, Bulletin number each intervening Thursday, 2.00 "
Dollar Edition, large number FIRST THURSDAY of every month, Bulletin number each intervening Thursday, 1.00 "

RATES OF ADVERTISING: ONE INCH.

ONE INSERTION, - - - - - \$3.00 SIX MONTHS, - - - - - \$45.00
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THREE MONTHS. - - - - - 26.25 Rates for larger spaces quoted on application.

New York (Main Office), 232-238 William Street,
Philadelphia, Forrest Building, 117-119 South Fourth Street,
Pittsburgh, Hamilton Building, 235-237 Fifth Avenue. DAVID WILLIAMS CO., Pub'rs
THOMAS HOBSON, Manager.
ROBERT A. WALKER, Manager.

Pittsburgh, - Hamilton Building, 335-337 Fifth Avenue,
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Entered at the Post Office, New York, as Second-class Matter.

